NOVEMBER
1960
Vol. LVIII, No. 8

The CATHOLIC EDUCATIONAL Review

IN THIS ISSUE

UNDER THE DIRECTION OF THE DEPARTMENT OF EDUCATION
The CATHOLIC UNIVERSITY of AMERICA

The CATHOLIC EDUCATIONAL *Review*

Vol. LVIII November, 1960 No. 8

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Published monthly September through May by The Catholic Education Press, The Catholic University of America, Washington 17, D. C. Subscription price: yearly, $5.00; single number, 60 cents. Indexed in The Catholic Periodical Index, The Education Index and The Guide to Catholic Literature. Second class postage paid at Washington, D. C.

Business communications, including subscriptions and changes of address, should be addressed to The Catholic Educational Review, The Catholic University of America, Washington 17, D. C. Please address all manuscripts and editorial correspondence to the Editor in Chief, 302 Administration Building, The Catholic University of America, Washington 17, D. C.

The Madonna Speller

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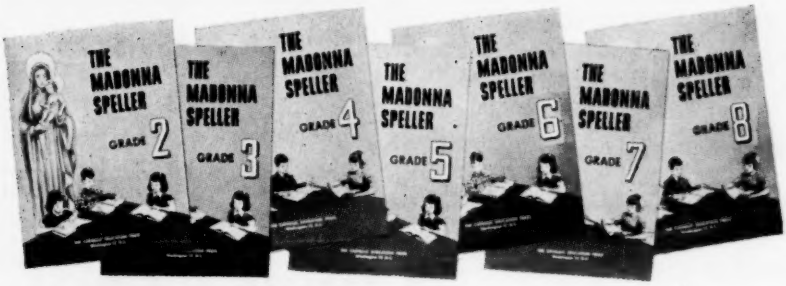

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ON TEACHING "ALL ABOUT SCIENCE"

By Raymond J. Seeger*

IT SO HAPPENED in the summer of 1960 that I was invited by The Catholic University of America to give a course on "Physical Science for Elementary and Junior High-School Teachers." My qualifications? The frustrations of an anxious parent! The curiosity of a seeking scientist! The sharing of an enthusiastic teacher![1] The perennial challenge of presenting ideas de novo![2] It occurred to me that others might be interested in my summer experience.

The Department of Education of the University supplied me with an analysis of the five series of elementary science textbooks (Grades IV to VIII) most widely used in Roman Catholic schools throughout the United States. Various topics in the physical sciences were listed according to the total space used. The distribution was relatively as follows: Physics 16 units (matter 2, motion 5, energy 3, sound 1, heat 1, electricity and magnetism 3, light 1); Chemistry 2 units; Astronomy and Earth Sciences 9 units (solar system 5, universe 1, weather 1, earth composition 1, natural resources 1, geological changes 1). I decided to include all these topics in the course (except those dealing with the earth's crust). In each case, I identified those concepts and laws essential to understanding the physical phenomena involved. The course consisted primarily of discussions of these ideas. The students, however, probably benefited most by giving individually demonstration talks on the more important principles, as they would be presented to classes of different grades.[3] Prior to the consideration of any topic, the students were given a short-answer quiz to determine the present state of their knowledge about that particular subject. As might be expected, the class was not unusual in its lack of understanding of basic physical ideas.

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[1] R. J. Seeger, *Our Physical Heritage* (Ann Arbor, Mich.: Edwards Bros., 1938).

[2] M. Faraday, *The Chemical History of a Candle* (New York: Viking, 1960); T. H. Huxley, *Lay Sermons, Addresses, and Reviews,* and *A Piece of Chalk* (New York: Appleton, 1870).

[3] *UNESCO Source Book for Science Teaching* (Amsterdam: UNESCO, 1956).

ELEMENTARY-SCHOOL SCIENCE TEXTBOOKS

In looking over the various textbooks, I was completely at loss as to what had motivated the choice of the particular concepts and the grades assigned for teaching them. From the viewpoint both of logical and psychological presentation of scientific ideas much was obviously wanting. In some instances, indeed, fundamental concepts were incorrectly presented, and in many more cases incompletely, so that on each regular test the class found it stimulating to criticize about ten such misstatements from both scientific and pedagogical points of view. (The illustrations chosen in this article are all from the one series that I examined in detail. I do not know if they are typical of the other series. My general criticism, however, does apply to all the texts.)

My primary objection to such texts is that most of the material is at best only nominal, that is, learning by modernized rote merely the names of things—if even that (for example, the definition of oxygen as "a gas that makes up about one-fifth of the air" is not too helpful). There is evidently a determined effort, increasing with grade level, to teach "all about science," but not at all a hopeful desire to learn science as a way of understanding nature. What is worse, the same material is frequently repeated in consecutive grades with no obvious, cumulative progress or curricular relation. Why, then, are particular topics selected for certain grades? Are social objectives the dominating ones? What about scientific goals? Evidently any answer to this basic question depends upon one's own conception of science itself.

TEACHING SCIENCE IN SOCIAL STUDIES

I am reminded of a personal experience I had some years ago. My daughter, in the third grade, brought home some interesting diagrams about stars and planets. "Aha!" I said. "You are studying science at last." "Oh, no! Daddy," she exclaimed, "this is social studies!" Who would wish to be an old fuddy-duddy daddy that doesn't know the difference between social studies and science? I responded quickly, "Of course!" Afterwards she came home with pictures of dinosaurs. This time I was more cautious. I inquired, "Could this possibly be science?" She laughed, "Oh, no! Daddy—social studies!" It so happened that on Fathers' Day I visited the school. During the class period one of the bright youngsters asked

the teacher, "Don't you think this material on dinosaurs is really science?" Later I was sharing my dilemma with some members of the Federal Schoolmen's Club in Washington. Someone across the table, a professional educator, volunteered, "Oh, I can explain what is bothering you. In the elementary grades pupils are learning about their neighborhood; yonder is our neighbor the moon, and our neighbor long ago was the dinosaur." I got the point. But did the pupils? or even the teacher? Mention of dinosaurs reminds us that adaptation to environment may be too specialized for a changing world. General adaptability is more important in the long run.

At that time I was quite indignant about any such so-called teaching of science as a branch of social studies. I abhorred the social bias even in the definition that "mechanics is the science of building and using machines." Nowadays, I must confess a slight change of heart. If school revolves about indoctrination as to the character of the world in which we live, it is not unreasonable to have man's view of nature portrayed as a part of such social studies.[4] Nevertheless, let us not deceive ourselves in this process. In no sense is the teaching *about* science the same as the teaching of science! Furthermore, if this is the only way that science is to be taught in the elementary grades, it might be preferable not even to call such material science—but rather social studies. The potential, social value may be outweighed by a permanent damage to the personal understanding of science itself. No question, I believe, is more important in elementary teaching than the concept of science and the associated goals of science teaching. My concern, of course, is the indelible effect of elementary education upon a pupil's attitude and approaches to science later both in secondary school and in college.[5] I am personally convinced that science, as I understand it, can and should be taught in the elementary grades, provided it is taught, and taught well, as science—not as social studies.[6] Strangely enough, although all texts strive valiantly to integrate scientific and technological knowledge with social problems, little attempt is made to take advantage of the natural integration of physical science and arithmetic, a

[4] W. H. Bragg, *Old Trades and New Knowledge* (London: Bell, 1926).

[5] R. J. Seeger, "Mathematical Science and the Manpower Problem," *Mathematics Teacher*, L(1957), 10-18.

[6] A. U. Peryshkin, G. L. Faleyev, and U. U. Krauklis, *Russian 6th Grade Physics* (9th ed., Moscow: 1957), and *Russian 7th Grade Physics* (Moscow: 1950), trans. J. F. Neely (St. Louis: 1959).

relationship which is largely responsible for the historical development of science.[7] Certainly science will thereby become more understandable, and arithmetic itself more meaningful.

NEED FOR PRECISE DEFINITIONS

Let me make some specific comments about the topics covered. We started with the need for special words that are descriptive symbols of things and of events—a technical language. We discussed the desirability of operational definitions which should answer the questions, how and how much! Elementary texts seem generally to make no effort to concentrate upon precise concepts in their intentionally diluted approach. There is, indeed, a valid question as to whether modern reading techniques, stressing a swift survey (much material —superficially), are adequate preparation for the slow, careful reasoning requisite for scientific description (little material—profoundly). As in literary language, each scientific word has a proper meaning dependent upon both grammatical use and context. Ordinary words on the other hand, usually have multiple meanings. A common denominator may be nonexistent; only specific examples of usage can then be enumerated. Far from logical exactness in textbooks one meets frequently circular definitions; a gas, believe it or not, may be defined as "anything that is not liquid or solid"—with corresponding statements for a solid and for a liquid. One finds meaningless complements like the statements that an atom is "one of the very small parts of a molecule" and (in the same series) that "a molecule is made up of atoms." A primary consideration for such textbook writers should be to define a definition.

To illustrate scientific definitions we chose some physical and chemical properties of matter, for example, specific properties of substances. I was surprised to find in elementary texts a fundamental concept like specific gravity mentioned only casually, and a common one like density often not treated at all until the eighth grade. Fluids, on the contrary, are usually discussed at great length. Here it is customary to talk much about pressure—without ever defining it. For example, although the pressure in a fluid has the highly significant attribute that it is the same in all directions at any point,

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[7] A. Calandra, *Science Units* (St. Louis: St. Louis Schools, 1959); and R. J. Seeger, "Physics for the First Grade," *American Journal of Physics,* XXVII (1959), 494-500, and *School Science and Mathematics,* IX (1959), 169-178.

this fact is rarely even mentioned so that air pressure is often erroneously represented as merely "the pressing of air *down* on the earth." Textbooks, moreover, pay comparatively little attention to Archimedes' principle and to Pascal's principle, both of which, I believe, can be well taught in elementary grades. Surface tension, although very attractive, at the same time looks more formidable for scientific instruction.[8]

Machines are quite familiar in everyday activities at home, at school, at play.[9] After necessarily discussing the measurement of force and the idea of work, we dealt with the characteristics of all machines, namely, mechanical advantage, speed-ratio, efficiency—with simple machines as examples. These concepts can be presented numerically at different levels of sophistication; for example, how many times greater than, or what fractional part of (fractions, decimals, percentages), or the ratio of?

MOTION, ENERGY, AND HEAT

Motion, was the first major topic, inasmuch as mechanics is fundamental to all physics, both classical and modern.[10] We approached the concept of speed (often mentioned in texts, but rarely defined) first by time tables for travel, then with pictorial graphs, and only finally by a defining formula, which I believe, should be employed only when helpful to understanding for use. I am of the opinion that the next logical concept, acceleration, which involves the time-rate of change of speed, should be restricted to qualitative considerations, and not extended to quantitative precision at these grades. The mechanical concepts of inertia and of reaction, too, are both better treated qualitatively here. How much one can, or should, do effectively with respect to Newton's laws of motion on this basis is a moot point. The concepts of mass, the measure of inertia, and of momentum are certainly difficult at all educational levels.[11] A common textbook error is to regard inertia as "a tendency of a body if not acted upon by a force, to remain at rest or to continue in motion in a straight line"—without noting the all-important condition of

[8] C. V. Boys, *Soap Bubbles* (Garden City, New York: Doubleday, 1959).

[9] M. C. Mott-Smith, *This Mechanical World* (New York: Appleton, 1931).

[10] O. W. Gail, *Romping Through Physics* (New York: A. A. Knopf, 1934).

[11] R. J. Seeger, "On Teaching the Philosophy of Physics," *American Journal of Physics*, XXVIII (1960), 384-393.

constant speed. One shudders to think of children trying to understand the celebrated coin-card experiment as due to the supposition that the coin's "*tendency* to remain at rest is greater than its *tendency* to move with the cardboard." As for revolving bodies, one should at most be content to note qualitatively examples of centripetal force —particularly satellites.[12] Rotating objects afford interesting phenomena out of this world of the commonplace.[13]

The next topic was energy, potential and kinetic energy, as well as the conservation of mechanical energy.[14] Energy, undoubtedly one of the most popular and least understood topics, is discussed at great length in all textbooks, where it is hardly ever defined at all—much less completely. For example, when my son was in the fifth grade, he had to learn a definition of energy as "capacity to do work." (Strictly speaking, one does measure energy by the work possible.) I asked him about the meaning of work; this idea had not been discussed. In the sixth grade, he was given the same meaningless definition. What do we gain by using an undefined word like energy? Why not use any other word such as "meden" (nothing, in Greek)? It is not surprising, therefore, to find such erroneous notions as "energy is always linked with movement" and "we must have energy to make things move." A common error is the use of a technical term such as power in a statement like "energy is the power to do work." Energy is never power in physics! Scientific terms are always single-valued in meaning.

Heat was the next logical subject.[15] Here one has to begin with a careful distinction between the notion of temperature and that of quantity of heat—not at all obvious and, not unexpectedly, presented poorly as a rule. We find incorrect remarks such as "heat energy—the motion of molecules," and "we measure the heat of the air by reading the number on the side of the tube." This confusion is typical of attempting to follow a complex, theoretical approach in lieu of a natural phenomenological one. The so-called method of mixtures, based essentially upon the conservation of thermal energy, on the other hand, affords exceptional opportunities for teaching mathematical science at about the eighth grade, where pupils are becoming

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[12] J. F. Neely (trans.), *Interplanetary Travel* (2nd rev. ed.; St. Louis: 1960).

[13] J. Perry, *Spinning Tops* (New York: Macmillan, 1929).

[14] M. C. Mott-Smith, *The Story of Energy* (New York: Appleton, 1934).

[15] M. C. Mott-Smith, *Heat and Its Working* (New York: Appleton, 1933).

acquainted with the use of simple algebra. Above all, they will gain familiarity with the variations of data and hence with some limitations of science. Although I believe it is highly desirable to integrate arithmetic with science, I question using scientific problems in an arithmetic vacuum, empty of scientific understanding. Formula-ism, addiction to the use of meaningless formulas, can become a powerful drug habit that eventually develops complete insensitivity to intellectual curiosity. Everyday arithmetic, of course, should be corrected by all teachers, but uncommon mathematics can be communicated only by mathematicians—and how to use mathematics is best taught by its users. Mathematics should be taught as mathematics; arithmetic, therefore, should be naturally employed in science teaching, not vice versa. Finally, we considered familiar phenomena of some practical importance such as thermal expansion, change of state, and particularly transfer of heat.

SOUND IN THE GRADES

We became alert to the sounds about us. We found difficulty overcoming notions like "every sound begins with a vibrating object" and "waves are up and down motions." Sound is physically a wave, a disturbance propagated with a definite speed, by a medium. It may be produced by a quake or a quiver. We considered then the forced and free vibrations of a body and resonance phenomena. Finally, we examined the physical characteristics of musical notes. Aural anatomy is usually treated in elementary school; it should be included at this point—together with oral behavior.[16] Sound, it seems to me, is a subject which deserves much more attention in the early grades;[17] it can be related qualitatively to general culture, including music (cf. musical intervals).[18] Nevertheless, sound in most curricula is surprisingly ignored as a subject of intense interest.

DIFFICULTIES WITH MAGNETISM AND ELECTRICITY

Magnetism and electricity are more subtle phenomena, less visible and less tangible.[19] Handling toy magnets, we noted the essential behavior of poles and fields, of the qualitative law of force, of in-

[16] R. T. Beatty, *Hearing in Man and Animals* (London: Bell, 1932).

[17] W. H. Bragg, *The World of Sound* (London: Bell, 1933).

[18] J. H. Jeans, *Science and Music* (New York: Macmillan, 1937); and D. C. Miller, *The Science of Musical Sounds* (New York: Macmillan, 1934).

[19] W. L. Bragg, *Electricity* (New York: Macmillan, 1936).

duction, and of the earth's magnetism; we glanced briefly at a simple theory of microscopic, magnetic properties in terms of very small magnets. In the same way we treated electrostatics, including the basic concepts of electric charges, of the qualitative law of force, of induction and conduction, of lightning—and just a glimpse of the electron theory of matter.[20] Similarities and differences between magnetic and electrostatic phenomena were stressed. In general, I would strongly urge a phenomenological approach for so complex a subject. Otherwise, one must expect to find electrons defined as "particles with a negative charge" and at the same time a negatively-charged body regarded as one with "an excess of electrons"—another instance of circular definitions.

How can a pupil be expected to understand a definition of electricity as "a form of energy that can be carried along wires!" (What about heat and sound in this connection?) We became acquainted empirically with a few fundamental properties of electric currents and with some common sources of electric currents—with special attention to series and parallel connections of electric currents, as well as simple, practical relations between current and voltage (Ohm's law) and between current and power (cf. the markings on electrical equipment).

VAGUE ATOMIC THEORY

Throughout elementary textbooks there seems to be an uninhibited desire of authors to impress youngsters dogmatically with the atomic theory of matter—with little attention to any evidence as to its scientific validity. Its existence is hardly more mysterious than man's ferreting it out. People, however, seem satisfied to explain unknown phenomena in terms of still more vague theories—on the supposedly authoritative statement of some "expert." Let us keep the material in this area at a phenomenological level, as the human race first learned it. (Ontogeny recapitulates phylogeny intellectually—to a large extent.)

INTEREST IN LIGHT AND COLOR

Phenomena associated with light are surprisingly neglected, despite their natural relationship to art and buildings.[21] Beginning with

[20] L. B. Cohen (ed.), *Benjamin Franklin's Experiments* (Cambridge: Harvard University, 1941); and R. J. Seeger, "Franklin as a Physicist," *Journal of the Washington Academy of Science,* XLIX (1959).

[21] W. H. Bragg, *The Universe of Light* (New York: Macmillan, 1934).

silhouettes, we observed the rectilinear propagation of light and constructed a pinhole camera with real film for picture-taking. In this connection, one should mention briefly the speed of light, and discuss the so-called inverse-square law of illumination as an illustration of the conservation of energy. The fundamental law of regular reflections can be "discovered" by the pupils from their own observations. Plane mirrors, however, are about as complex as one should consider here; the very images involved are only virtual (not real). Although the basic law of refraction permits only qualitative, or empirically quantitative consideration at this level, it can be readily applied to the behavior of light through a prism and hence through a simple lens (effectively a pair of prisms with a common base). We merely noted the use of lenses in telescopes and microscopes, in the camera and the eye—we avoided details. Color phenomena lend themselves more easily to interesting observations and simple investigations.[22] Having seen how sunlight is decomposed prismatically into the various hues of the rainbow, we learned to distinguish primary lights and primary pigments. In passing, we called attention to the electromagnetic theory of light. Here, too, elementary textbooks bask in an overabundance of information, exhibiting many elaborate details as to all kinds of radiations, such as, infrared and ultraviolet light, radio waves and X-rays. Again I would emphasize that teachers often seem more eager to cover material than to uncover nature's secrets. In their anxiety to advance their protégés, instructors have them reaching up without too firm a footing. There is "too much, too soon!"

ASTRONOMY WELL TAUGHT

We need to look up at moonlight and sunlight—at the stars.[23] The simple facts of astronomical theory are apparently rather well taught. What is flagrantly omitted, is the deep joy of observing the night sky! Was it not Thomas Carlyle who regretted that no one had ever taught him as a boy even the names of the stars? I would begin

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[22] M. Minnaert, *The Nature of Light and Color—in the Open Air*, trans. H. M. Kremer-Priest, rev. K. E. B. Jay (New York: Dover, 1954).

[23] R. H. Baker, *Introducing the Constellations* (New York: Viking, 1937), and *When the Stars Come Out* (New York: Viking, 1937); J. M. Chamberlain and C. D. Nicholson, *Planets, Stars, and Space* (Mankato, Minn.: Creative Education Society, 1957); and J. H. Jeans, *The Stars in Their Courses* (New York: Macmillan, 1936); and *Through Space and Time* (New York: Macmillan, 1935).

by having pupils observe and record the times of sunset and moonrise, the paths of the moon and of the planets themselves, and then compile a simple sky chart with dotted figures. Later they should measure time with a sundial, as well as with a water clock. They should determine the height of a tree by its shadow and its distance by parallax with respect to a more distant object. It is important to learn early in science the power of indirect measurement—by means of simple mathematics (in this instance, geometry, which I believe should be approached empirically as man himself first learned it, that is, earth-measurement).

An acquaintance with the solar system, as we now know it, should be included; above all, appreciation of how we have come to know the earth's shape and its motions, both its rotation and revolution. As for other planets, I would restrict the facts to a few that are uniquely interesting, such as Venus' brightness, Mars' markings, Saturn's rings, Jupiter's spots, and others—likewise for the comet family, for meteors and meteorites. Amid all this awesome grandeur we should emphasize that man is confronted here with many unanswered questions: the origins of the solar system, of the stars, of the universe, as well as the very origin of life itself. As teachers, we should be very careful not to fill the minds of children wholly with the tenuous "fairy tales of science," which are ever fascinating to the speculative theorist, but which may not yet be of solid worth to the average layman. Necessarily incomplete and possibly incorrect, they may needlessly upset moral and spiritual values at a critically formative period of adolescent children. The Mosaic Code warned men not to dig a pit without covering it—for the protection of the unsuspecting passer-by.

IGNORANCE OF ATMOSPHERIC PHENOMENA

We live between the sky and the earth—with atmospheric phenomena.[24] Here we have an everyday opportunity to observe, to classify, and even to perform some simple measurements (in pressure and temperature of the air, nature and amount of condensation, and the like). A tremendous amount of material is given in textbooks about the dynamical processes of meteorology, but very rarely are the few physical principles involved in them even mentioned—much

[24] R. J. Seeger, *On Nature Study in Physics Teaching* (Submitted for publication, 1960).

less discussed understandingly. In some texts, indeed, I found much more attempted in meteorological information for elementary schools than I personally would wish to include even in a sophomore course in college physics. The fundamental physical phenomenon here is vapor condensation, including evaporation, sublimation, and boiling, as well as humidity, dew and frost, fogs and clouds. The peculiar property of air, containing water vapor, to condense upon sufficient expansion should not be overlooked. As far as the weather itself is concerned, one must understand that the observed meteorological elements are essentially based upon a few physical quantities, which also can be measured. Weather is a physical process! It is important to become familiar early with the technical definitions used in weather reports (for example, how much fallen water constitutes rain). One should be satisfied with general ideas as to the nature of rain and snow, hail and sleet, as well as lightning. Presumably educated people will always believe that clouds are made up of water vapor (a gas) and "that hail is frozen rain" (sleet)—but why do we have to perpetuate such misconceptions through our schools? Why must we still teach the Aristotelian doctrine that "because warm air is light, it rises" (warm air is *pushed* up). We should hardly expect, moreover, in any civic minded school to be taught that the Weather Bureau is "a government *department*" (definitions again).

WHAT TO TEACH!

We attempted to cover all these topics in the course because they are the ones usually included. If I were to devise my own curriculum, however, I would omit even more than I did in restricting myself initially to the fundamentals of the various phenomena observed. What we teach will necessarily be incomplete, but it should be true as far as it goes. Evidently much validated evidence is required as to what physical concepts should be taught, at what grades they should be phenomenologically introduced, how they should be experentially presented, and how (if at all) they should be mathematically formulated—as science. We need teams of research scientists, educational psychologists, and practicing teachers, all looking at the logical, psychological, and social appropriateness—and not primarily administrators focusing on cultural indoctrination.

With this brief review, perhaps, we can appreciate better the importance of an individual's conception of science. I have acquired

a habit of asking apparently complacent faculty groups to define science—before I give my own interpretation. Two common views are that science is generally systematized knowledge (typical of secondary-school teachers) or that science is particularly a study of the world about us (typical of college teachers). The first definition is obviously static; the second one more dynamic. The first calls to mind a well-organized storehouse of facts; the second points to the fields from which they have been gleaned. My summer class was about equally divided between these two points of view. I believe, however, that an important element is being overlooked. What is science? Certainly our answer will determine to a large degree what and how we teach science.

This summer I asked the members of a college institute on the History and Philosophy of Science to indicate the chief characteristics of the scientific method. There was no general agreement on the important factors, not even on the most significant one. The majority agreed only on one attribute, the self-correcting check of nature. The roles of observation and of experimentation were next in order of frequency. About equal emphasis was laid upon identification of the problem, analysis of relations, and use of hypothesis and theory. The role of imagination was mentioned by only one person—the very point I myself regard as highly significant. So let me outline my own view.

WRITER'S OWN VIEW OF COURSE

First of all, we must differentiate sharply between science and technology, namely, the applications of science. Science is certainly not "Information, please"; it is not some kind of mysterious gadgetry; it is not a vague magical power. What we call science (loosely, knowledge), strictly speaking, is the result of a peculiar way of investigating nature—what has been termed the scientific method, and which is not understandable except in terms of the scientist who employs it. The "what" of science is less important than the "how" of the scientific method, which is meaningless except in terms of him "who" uses it. Very much of what is taught in elementary schools nowadays is unquestionably merely the applications of science —not science as a living, growing experience. Look at the many illustrations in modern textbooks. Do they not usually show complex social products rather than simple, natural phenomena? The four technological revolutions, namely, the utilization of mechanical

energy, of electrical energy, of chemical energy, and finally of atomic energy, to be sure, are properly emphasized in social studies.

The scientific revolution, however, is quite different.[25] It took place when man discovered a new way of getting answers to his questions by investigating directly natural phenomena themselves (science was actually born in the Greek period; it was reborn in the seventeenth century). A second phase of the scientific revolution can be said to have occurred in the twentieth century, when certain individuals such as John Dewey asserted that answers to all meaningful questions can be obtained by the scientific method. In other words, science is applicable to all fields of inquiry. At any rate, science and technology, although related, are distinctive—and should be distinguished in our teaching. Let us examine science more closely.

Science is rooted in empirical soil. I experience something! I have certain sense impressions; they may be more or less vivid, they may be past or present, they may be given or sought. What is significant, is that I am personally involved. There is always a subjective element, although it may not be obvious. For example, for years people discussed what has been called the green flash, which occurs just as the sun sets or rises. Many individuals regarded it as purely subjective until Father D. J. K. O'Connell of the Vatican Observatory recently took some beautiful photographs which to a large extent recorded the phenomenon independently of any observer.[26] The subjective element, however, can never be completely eliminated; it can only be partially removed to varying degrees, dependent upon one's ability to isolate and to control phenomena. The great progress of the physical sciences is owing to the realization of this very possibility, as contrasted with the social sciences. It is not that the physical sciences are more important, or that they have been studied more diligently, but simply that their phenomena are easier to investigate.

DEVELOPING HABIT OF CAREFUL OBSERVATION

When I experience something, I find myself unconsciously emphasizing certain aspects of my observations. Have you ever gone down the street and unknowingly passed by a friend? The next day

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[25] F. Sherwood Taylor, *An Illustrated History of Science* (London: Wm. Heinemann, 1955).

[26] D. J. K. O'Connell, *The Green Flash and Other Low Sun Phenomena* (New York: Interscience 1958).

he says, "Why did you pass me without speaking to me?" Truthfully you say, "I never saw you." "But your eyes were wide open!" "Yes, but my thoughts were elsewhere." We don't see just with our eyes, we use our minds also. So, too, in observing nature, we are impressed by some particular aspect. We do not observe everything that we see. In looking *at* something, we are more likely looking *for* some familiar marks. For example, what do you really see when you look at a tree? A boy sees something to climb; a gardener something that grows; a botanist something to be understood.

As an individual, therefore, I apparently select certain aspects of what I observe. Thus as a poet I am attracted by an emotional appeal of an experience; as a man of religion I am compelled by a mystical wholeness. In both these cases, I find myself stressing individual differences and unique peculiarities. Accordingly, there is a tendency for me to speak of such an experience in the singular: "I see this!" "I observe that!" The scientist, on the contrary, is fascinated by some reasonable outlook; he never looks *at* everything, he usually searches *for* something. His quest frames his question. The intellectual process signifies just such discrimination, a selection from among things (as the word itself means etymologically). As a scientist, moreover, I am prone to look for a common core of experience, what we might call common sense. We speak in the plural: "We observe these!" We, therefore, strive for common means of communication, for accepted standards of definition. What we, as sharing scientists, observe in nature, we shall call observed facts. The progress of science is peculiarly dependent upon the dedication of scientists to absolute truthfulness with respect to observations—an unexpected moral by-product.

In the beginning, some people were wont to regard science as being merely the collection of particular, observed facts, together with such general inferences as could be drawn from them. We do have to be cautious about jumping to conclusions. Suppose I note that my daughter is called by a certain boy on Monday, Wednesday, and Friday evenings. Can I assume that he has actually called every night? Perhaps, on Thursday night he telephoned the girl with whom he eloped on the following Saturday. As physicists, moreover, we have learned that observed facts may be critically dependent upon how the observations are made. We may even appear to be pedantic when we stress that the concept of length used in measuring a table is not necessarily a priori the same as that involved in

the determination of the distance to the moon or to a nebula, and in the measurement of the diameter of an electron or of a nucleus. We insist that our physical definitions be operational; we must tell how we obtained experientially what we say we know. For example, by definition a negatively charged body is one that behaves like a hard rubber rod that has been rubbed with cat's fur. A definition is thus always specific; it must be crystallized in definite terms—not in amorphous verbiage. The concepts of physics have to be formulated as concentrated summaries of information, not in the dilute suggestiveness of analogies.

In learning all about science, therefore, we may fail to discern the very meaning of science itself. Evidently one of the chief educational problems of all popularization of science is to determine what aspects of a definition are sufficiently significant at each stage of popularization to be mentioned and which can be appropriately ignored. We must not miss the whole forest because of our concern about the individual trees; on the other hand, we cannot have a forest without trees. It is this dilemma that prompts me to be concerned at each grade level with comparatively few fundamental, scientific concepts rather than to be tempted to teach "all about science" all the time.

Common sense, the cumulative science of yesterday, is invariably challenged by the research frontiers of today. Let me illustrate with an everyday notion like simultaneity. Do we not all know with certainty whenever two events occur at the same time? In the following example we shall take for granted only one accepted observation, namely, that the speed of light as measured in a vacuum is always the same, regardless of any relative motion of the observed and of the observer. Here is a trailer. Right in the middle of the trailer is a candle. If one lights the candle, will the spreading light strike the front and rear ends of the trailer simultaneously? Inasmuch as the distances are the same and light travels with constant speed, it is obvious to two people in the trailer that these events will take place at the same time. An observer on the outside, however, is aware that the trailer is moving so that light will evidently reach the front end before the rear end. Both observers are correct—nothing is logically wrong with their conclusions, based only on the assumed constancy of the speed of light. We must admit that simultaneity is meaningful only to a particular observer. The task of relativity theory is to formulate what is truly invariant for all ob-

servers in such instances. No wonder our entire physical conceptions of space and of time have had to be altered—all because we insisted upon defining operationally a "self-evident" axiomatic idea like simultaneity.

Our observed facts are bricks prepared out of the empirical soil. In forming them we find an unexpected uniformity of nature, we boldly assume this uniformity at all times and at all places. Above all, note that it is the scientist who selects, it is the scientist who observes, it is the scientist who infers!

REASON IN THE SCIENTIFIC METHOD

Rising above the empirical earth, we enter next a rational atmosphere. We learn to reason about the observed facts. Watch a child with a number of objects of different colors, shapes, and sizes. He playfully puts similar ones together, arranges them in a simple pattern, and then rearranges them as his fancy dictates. So too, the primitive scientist classifies stones and clouds, leaves and bugs. Identification, indeed, is not always obvious. John Kepler, who first recognized the orbits of planets as ellipses rather than circles, expressed his great thrill at discovering the laws of planetary motions as follows: "The die is cast, the book is written, to be read either now or by posterity, I care not which. It may well wait a century for a reader, as God has waited six thousand years for an observer." Such identification of things and the recognition of phenomena, I believe, is the first scientific lesson to teach youngsters—absolutely prerequisite to any attempted theoretical understanding. Let us stop, look, listen—and then reason.

Isolated facts, however, are rarely of continuing interest. How many of us enjoy memorizing all the numbers in a telephone directory or all the information in an encyclopedia? Why do we expect greater success with a textbook (too often a collection of unrelated texts)? On the contrary, we select numbers according to our needs and information related to our own interests. We are always seeking relations among the ever crowding facts that press upon us. To illustrate, let us consider the difficult responsibility of determining the grades of students in a class. Are there any related factors that would make selection more automatic, more objective? Have you ever noticed in any large class that there are usually some very high grades, some very low ones, and the rest drift anonymously in

between these? Have you observed also how few students exhibit very long noses, how few sport very short ones, how many seem to have noses of average length? Is there possibly any relationship between the grade of a student and the length of his nose? Do not laugh! What real evidence do *you* have that no such relationship exists? Have you yourself ever made such an investigation—or even heard of one? The search for such related factors is the sequel to identification; it is the next step toward our understanding of science.

I have often been tempted to ask pupils to bring bottles to class some day. (I have always been somewhat hesitant because of uncertainty as to the kind of bottles that might be brought). We would take these bottles, weigh them, then fill them with water, and again weigh them—we could thus obtain the weight of water in each bottle. We would then fill the bottles with some other liquid and similarly find the weight of this liquid in each instance. For each bottle, therefore, we would have two numbers; the weight of water and the weight of the other liquid. What can one do with any two numbers? We can add them, or subtract them, or multiply them, or divide them. If we do so heuristically, we make an amazing discovery: regardless of the size or shape or color of a bottle, the ratio of the weight of the other liquid in it to the weight of the water (which, of course, will have an equal volume in each case) will always be the same for that particular liquid. It is apparently characteristic of the substance and can be used to identify it. Accordingly, as scientists, we find it convenient to designate by a special term, namely, "specific gravity," this process of weighing something and then water of an equal volume, and finally dividing these weights. It is a creative concept, expressed operationally and quantitatively. We do not observe it directly in nature; we invent it in order to describe our observations. This concept, introduced by Archimedes, was actually one of the first in the history of physics.[27] Modern pupils would do well to follow in the same pioneering steps—and thus at the same time to appreciate more intimately the scientists who first blazed adventuresome trails.

ROLE OF IMAGINATION IN SCIENCE

As we focus our thoughts upon observed facts, with amazement we glimpse indistinct and incomplete relationships. We seem actually

[27] F. Sherwood Taylor, *op. cit.*

to be understanding nature—in some degree. Accordingly, man assumes daringly that nature everywhere will always be comprehensible. Note once more: it is the scientist who relates, the scientist who creates, the scientist who forms a rational pattern! This phase of the scientific method affords optimum opportunity for effective teaching at all levels.

Soaring above the rational atmosphere, we now seek more rare, imaginative vistas. Imagination is really the key to significant scientific progress! As my four-year daughter was marching by one day, I asked her what she had on her shoulder. "A gun!" she called. I looked—it was just an ordinary stick. The next day as she was galloping past, I inquired as to what she was straddling. "A horse!" she shouted. It was the same stick! In kindergarten a child sees in an ordinary stick, now a gun, now a horse. Thus through the ages men have turned sight into insight. In the studio the artist sees in things more than appears upon the surface. Joseph M. W. Turner was once taunted by a critic, who claimed that he had never seen a sunset such as Turner had painted! The artist replied, "Don't you wish you could?" Georges Rouault was once asked how he was able to paint so well the white trees of spring. He answered, "By observing snow-clad fields in winter!" Such association of different phenomena requires imagination! In the laboratory, above all, the scientist imagines.

There's a legend—probably apochrypal—that Isaac Newton as a young man was sitting under an apple tree when suddenly an apple fell on his head. He thought, "How lucky that it was not the moon!" Could one regard the moon as a big apple? or an apple as a little moon? With this idea that the same law of force might apply to moons and to apples the modern universe was conceived. Up to this time, despite the tell-tale telescope of Galileo, there were two distinct spheres about man: heaven with its permanent perfection and the earth with its perpetual changes. There was no truly physical universe—until Newton imagined it! Nowadays, when we are asked to describe an atom we are wont to say, "It is like a solar system." To envisage the cosmos of the planets in the microcosm of an atom—that, too, requires imagination!

One more historical instance! Imagine a chain consisting of alternate links of copper and of iron! If we start an electric current in the first copper ring, the surrounding piece of iron will become magnetized. As this magnetization takes place, there is induced an

electric current in the next copper ring, which in turn magnetizes the neighboring piece of iron. The change from no magnetism to magnetism induces a current in the next copper ring, and so on. We might properly describe this traveling disturbance as electromagnetic. Suppose we eliminate the iron rings and start an electric current in the first copper ring, thus inducing, in turn, an electric current in the next one, and in the others. Again we find an electromagnetic disturbance propagated. Let us now eliminate all the copper rings except the first one, which we make very small; will we get an electromagnetic disturbance propagated through the vacuum surrounding the ring? Such an electromagnetic wave was actually predicted in 1864 by Clerk Maxwell, an Englishman, on the basis of theoretical considerations. Calculating its speed to be the same as that of light, he concluded that light itself is essentially an electromagnetic wave. In 1887 a German, Heinrich Hertz, produced such waves—our modern radio waves, which travel with the speed of light. The story, however, is not yet finished. In 1931-32, Karl Jansky observed a radio noise in New York City; it was ascertained to be radio waves coming from somewhere in space. In 1946, a Dutchman, Hendrik C. van der Hulst, noted theoretically that the flip-flop of a hydrogen nucleus should produce radio waves 21 cm. long. In 1951, Edward Purcell, an American, detected radio waves of that very length from outer space. Thus began the new science of radio astronomy—typically international both in its scope and in its pursuit. Such predictions are truly daring! Their successes are even more startling! It is surprising, to me, not that we are able to describe what we know, but that through imaginative processes we are apparently able to predict what we don't know. Suppose I tell you that if you go 13 blocks north, you will find a building with 13 floors, the 13th room of which contains 13 cats of 13 different colors. Well, if you did go and find those cats, I would be humbly awed—I do not know if a building even exists there. Max Born, a distinguished physicist, has asserted that "Faith, imagination, and intuition are decisive factors in the history of science, as in any other human activity."

FORMULATION OF THEORIES

Out of imaginative vistas, we formulate a factitious theory. The word theory, you may recall, comes from the same Greek root as the word theatre; it signifies a view. It is broader than a hypothesis,

which etymologically means specifically something "set under," a foundation. The first person who sees an over-all view is customarily respected as a genius. As followers, we gradually appreciate its marvelous details, and finally enjoy its broad scope. In this respect science is no different from poetry or art or music. Very few people, to be sure, are able to create appealing poems, or haunting melodies, or compelling masterpieces—but we all can learn to enjoy them.

Some individuals are disturbed over apparently changing viewpoints of science. Nevertheless, if we stand today where Newton stood, we still see what Newton saw. If we look out from Einstein's vantage point, we can see much more. The view is different primarily because the point of view has changed. Whenever our use of scientific method changes the resulting science, the over-all view alone has changed. Some years ago Arthur S. Eddington illustrated what happens as follows. A child is assembling a few pieces of a jig-saw puzzle. A visitor asks what the picture will be. "Oh!" exclaims the child joyfully. "Those are white clouds in a blue sky." Later, when the visitor returns, he notes that the completed picture has neither a blue sky nor white clouds. Upon inquiry the child replies disdainfully, "Those were white caps on a blue sea!" The original pieces still remained together in the same way as before; only the over-all picture had changed. In this process we are ever impressed with the incompleteness of our fragments, with their ragged edges, with their worn appearances. Our theory is truly man made—and subject to all human limitations.

With each new viewpoint, our attention becomes focused upon landmarks which we had not previously detected in the misty landscape. We ask deductively, "What is that?" Attempts to get answers to such questions may result in new observed facts. These we analyze further for related factors and then try to synthesize them all through an imaginative vista into a factitious theory. New questions disturb us continually; new answers satisfy us temporarily—an ever spiraling process! The cumulative growth of science is one of its distinctive features. What we have discussed here might be called an ideal model of the scientific method. In some fields different phases are actualized only partially. I prefer to regard these shortcomings as incomplete realizations of the ideal; others prefer to speak of a spectrum of different scientific methods—an equivalent way of speaking.

We are bound at all times only by two checks: (1) that our

described and predicted observations agree with natural phenomena within the limits of our observations, and (2) that the community of scientists agree that there is such an agreement within the limits of our reasoning. The latter is tacitly assumed by us; it is rarely mentioned. Nevertheless, social acceptance is historically important in the development of scientific ideas.

SCIENCE APPEALS TO ALL AGE GROUPS

The spirit of this scientific method, I believe, can be understood and appreciated at all levels of education—in varying degrees. The same wonder-fulness, adventure-someness, joy-fulness, and fun-fulness can be experienced in kindergarten, where a child is first confronted with some strange phenomenon, as well as in an elaborate research program in a graduate school. Useless facts themselves are never as fascinating as the method of obtaining useful factors; all significant, however, is the spirit of the scientist who is pursuing truth for its own sake—or who is at least captivated by the thrill of the very pursuit. In teaching science in the elementary grades, therefore, we should strive to attain this spirit to the highest degree possible with a few carefully selected cases. By no means should we try to fill the youngster's mind with all the findings of science. Henri Poincaré once said, "Science is no more a collection of facts than a house is a collection of stones."

I would not, as some so-called humanists insist, stop the progress of man's science; at the same time I would not allow traffic to go in all scientific directions at once. My signal is the yellow one of caution! Each child must have some appreciation of the influence of science upon the development of the society of which he is a member—and later the influence of society upon the development of science. Some science material, therefore, should rightly be incorporated as a part of social studies. Nevertheless, let us not be confused in thinking that in so doing we are teaching science. We can talk "all about science"—without ever an inkling as to what science is all about.

Thomas H. Huxley said in an after-dinner address on "Scientific Education" in 1869:

> It is my firm conviction that a complete and thorough scientific culture ought to be introduced into all schools. By this, however, I do not mean that every school boy

> should be taught everything about science. This would be an absurd thing to conceive, and a very mischievous thing to attempt. What I mean is that no boy or girl should leave school without possessing a grasp of the general character of science, and without having been disciplined, more or less, in the methods of all sciences; so that, when turned into the world to make their own way, they shall be prepared to face scientific problems, not by knowing the conditions of every problem, or by being able at once to solve it; but by being familiar with the general current of scientific thought, and by being able to apply the methods of science in the proper way, when they have acquainted themselves with the special conditions of the problem.[28]

GUIDEPOSTS FOR ELEMENTARY SCIENCE

Here then are my guideposts for teaching elementary science: (1) select a comparatively few natural phenomena which are within the grasp of youngsters and which can be related, if possible, to concurrent studies such as music and art, as well as to history and literature (allow marginal leisure for serendipity), (2) teach the scientific topics from an experiential viewpoint, with pupil observation and measurement whenever possible (impress upon them the sanctity and surprises of data, the grandeur and frailty of theory), (3) correlate useful arithmetic with physical science (stress qualitative thinking before quantitative expression—avoid formula-ism), (4) watch out for moral and spiritual overtones (do not allow science to become superstitious dogma by superficial contacts).

In fine, don't try to teach *all about science!* Instead be scientific yourself. Your own enthusiastic interest—or lack—will be contagious. One inquiring mind sets another on fire!

* * *

School enrollment in the Archdiocese of Los Angeles has more than doubled in the past ten years. This year's enrollment is 159,398 pupils, 5,000 higher than last year, with 127,081 in elementary and 32,317 in high schools. Ten years ago enrollment in the schools was 69,522.

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The Diocese of Toledo reports a record number of sixty-six major seminarians, an increase of 50 per cent since 1951. During the same period, the total number of Catholics in the Diocese increased by only 28 per cent.

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[28] T. H. Huxley, *op. cit.*

AN ALLEGORY

By Robert R. Barr, S.J.*

YOU, TWENTY-FOUR, a brilliant young scientist, have been selected by the United States Space Commission for a visit to Mars, on which has been discovered, after all, human life. Your mission is to establish friendly relations with the race, undertaking all the experiments necessary for what is sure to be an invaluable scientific research project. You supervise the equipping of your space-craft, the loading and storing of supplies and scientific equipment, and are rocketed into space.

From the first, your sojourn proves a pleasant one. Your landing is effected with maximum success; careful remote-control samplings indicate that the atmosphere is capable of supporting your life; the temperature is that of a pleasant spring day in Kansas. You step out onto firm land and into months of adventure.

You walk towards the nearest settlement, agape at the breath-takingly weird beauty which surrounds you. The sky, hills, "trees," "grass," . . . are a riot of rich variegation. Your curiosity about the natives is soon pleasantly satisfied, and you settle down among them in their capital. They are gentle, cultured, intelligent, strong. They teach you their language, and become your pleasant assistants and companions.

Spring, summer, fall. The beauty of the autumn countryside draws you out for a Saturday hike with a well-known Martian lawyer. His interest in science and his appreciation of the beauties of nature have made him your most congenial companion, and together you enjoy the restful air of the green-glowing Martian twilight. Your command of his language is fluent now, and your day pleasant and easy.

On one point alone, you find, you and your interesting friend enjoy precious little meeting of minds. He seems unable to understand your references to the *colors* which greet your gaze. The Martian vocabulary suffers a puzzling dearth here. Wherever you remark a sweeping red, or a yellow blossom, or a many-hued fall forest, your companion's puzzled voice offers "bright" or "rich." You drop the matter.

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Tired from your long hike, you retire with great good pleasure. Your eyes close. You breathe more deeply. The sounds of a peaceful countryside again greet the ears of your imagination, and you seem again to view in rich detail all the wonders of the Martian landscape which you have come to enjoy so thoroughly. You hear your friend's voice. You recall your strange conversational impasse. Your eyes open again. You turn over. "Why can't he talk *color?*"

MEN WHO SEE ONLY ONE COLOR

You recall a snatch here, a phrase there—your fumbling questions, his nonplussed answers. Two and two make four. Your eyes are wide now. Your Martian friend saw nearly nothing of the beauty of his own country today. He is blind to color!

You recall that no Martian of your acquaintance has ever named a color. Your laboratory assistants are helpless before certain test-tube experiments. The only paint in their factories is an unattractive blue-gray protective coating for outdoor use. Four and four make eight. The whole race is color-blind.

And with an electrifying start, you remember a curious fact to which you have never before given any special attention . . . the fact that the pupils of the Martians' eyes are not clear, but yellow.

You spend the rest of the night pacing your bedroom floor. All weariness vanished, your wrinkled brow responds to the disheartening implications. No Martian has *ever seen color!* He has never seen red, green, blue, or even white. Everything is yellow. Bright, dark, yes . . . but always *yellow.* Why, he has *never even "seen yellow"!* —since he has never seen anything to *compare* yellow with, so as to *notice yellow as a color.* In short, he *does not know what it means* (1) to see *red,* (2) to see *color,* (3) to see *yellow!*

Fortunately, Uncle Sam picked a good man: physicist, chemist, linguist—surgeon. In the short space of six months you have developed a clear gelatin capable of replacing those yellow pupils. You explain the situation to the Martians. You set up operating rooms and prepare to receive the crowds.

But no one comes. Unable to comprehend your talk about "red," "green," and "color," the Martians, who don't know what they're missing, are apathetic and indifferent. They are unwilling to take the trouble, because they don't see what's in it for themselves.

Your friend the lawyer is a true friend indeed. With a real friend's

trust in your assurances of a new life of wonder and pleasure, he submits himself to your surgical skill. The operation is performed . . . without any results.

Further investigation discloses that the retina of the Martian eye, trapped for immemorial ages behind an amber pupil, is sensitive only to yellow light. Late one night you close your notebook with a heavy sigh—your studies reveal that a few treatments with a plentiful drug will render the Martian eye sensitive to one more color besides yellow . . . but no more.

You resolve to do at least that. You set up a program that will enable each Martian eventually to get the surgery and drug he needs to see one other color besides yellow.

Your discouragement gradually gives way to enthusiasm. You come to realize that the treatment will enable the Martians to (1) know some other color; (2) therefore appreciate what *color* is, by seeing that there can be two; (3) therefore appreciate what *yellow* really is after all.

But which color to choose? Red? The most exciting of colors, and *so* different from yellow. *Easy* to appreciate. A real thrill. Green, or blue-green? Not so exciting—more difficult to appreciate —but, on Mars, *far, far richer!* Oh, the number of shades of blue-green in that Martian landscape! An *appreciative* eye will derive far more pleasure on Mars from these colors than from red.

That decides you. For eyes which are less sharp, less perceptive of subtlety of shade, less appreciative of richness, you choose the drug which will splash thrilling flares of bright crimson across the sight of the man who has known only yellow. In seeing his first little patch of red, he (1) comes to know *red,* (2) comes to know color as color —(3) comes to know, after all these years, *yellow!*

For more discriminating eyes, you choose the bluish-green. When you can, you personally accompany the subject to the breath-taking Martian landscape, and you thank God while you stand next to a human being drinking in, for the first time, the fifteen thousand greens of the Great Forest—more calmly than the man to whom you showed red—but with far greater appreciation, pleasure, and value.

Some of the sharp-eyed Martians, having spoken with friends who were given red, insist on that color. Nothing doing. You give them their blue-green because you know better—and they are grateful for your choice ever after.

Some of the weaker-eyed Martians want blue-green, because, as

you have explained to the nation, this color is more worth while in itself. You tell them sympathetically that the many shades of green on Mars would be too subtle for them—green would be too difficult for them to see—God has not seen fit to give them sharp eyes—and they must accordingly content themselves with red. They humbly agree, and love and appreciate the color you have chosen for them.

And everybody lives happily ever after.

MEN WHO KNOW ONLY ONE LANGUAGE

The case is somewhat similar with *language.* Language is the eye of all intellectual endeavor. Just as the body learns *itself* and all its *surroundings,* and *how to operate,* through its *eyes,* so also the mind needs a genuine insight into *language* to develop its *own* thoughts, to grasp the thoughts of *other* men, and to *operate* with full human efficiency throughout life.

That is, $\frac{\text{eyes}}{\text{body}} = \frac{\text{language}}{\text{mind}}$. Language is as important as eyesight!

The Martians, able to see only *one* color, in a way saw really *none.* A man who knows only English is language-blind.

Seeing only yellow, the Martian (1) missed the fun of *red,* (2) missed the fun of *color as color,* (3) really missed the fun of *yellow!* And yet, didn't know what he was missing, and didn't mind!

Similarly, the man who knows only English (1) misses the fun of *Spanish,* (2) misses the fun of *language as such,* (3) gets little relish even from English! And doesn't know what he's missing.

Just a glimpse of just one other color corrected, in a partial way, all three of the Martian's "misses." Just a little of another language, done carefully and well, will correct all three of *your* misses!

A careful study of Spanish or Latin, even a brief one, will show you manners of expression you've never seen. (A thorough study of a foreign language—through several years—is much preferred. But a short study will help.)

You will be surprised to find things in another language that just *aren't* in yours . . . things you couldn't possibly have guessed. This is like seeing another color for the first time.

CHOICE OF SECOND LANGUAGE

If you have a choice of what language to learn—which to choose? Well, which color did you choose for each Martian? You matched

it with his eye-ability. Similarly, your school matches your language with your intellectual ability . . . for instance, *Spanish* has the advantage of being easier and quicker than the classical languages; it is like *red*—it provides a thrill, almost a shock. You speak it a little the very first day. You get an immediate insight into those three things you missed. It has the disadvantage of not being as *rich* a language as Latin or Greek—Latin and Greek are like the blue-green of the hillside, and you can go farther in language appreciation with them; but they suffer from the disadvantage of being harder and slower. They are only for better students.[1]

Now will you read the story again, looking at each detail for its application to the language-problem young Americans have? Thank you!

Don't be like the Martians who weren't interested in a new color because they didn't know any better. And don't be like the Martians who didn't like the *particular* color that was good for them.[2] Throw yourself into the study of the language you are taught, with confidence and enthusiasm. You will be richly rewarded.

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Thirty Catholic Air Force chaplains from bases throughout the country attended the fourth annual Air Force Chaplains Institute on Human Relations at The Catholic University of America last month.

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The College of Steubenville, Ohio, was granted a loan of $900,000 last month by the Federal Housing and Home Agency to build two dormitories. The College has 426 students.

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Ground was broken last month at Georgetown University for a new science building which is to cost $4.2 million.

* * *

Nicaragua's Congress has approved the establishment of The Catholic University of Central America. The first departments of the University, humanities and business administration, will open classes in June, 1961. Some two hundred students are expected to enroll the first year. Organizer of the University is Rev. Alvaro Oyanguren, S.J.

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[1] These are expected to get the easier languages (usually based on Latin) later if they need them.

[2] But don't expect quick results, either! Latin is not got by surgery.

THE KNOCKING AT THE GATE

By Sister M. Evarista, C.S.J.*

THE PRESENT EDUCATIONAL ALERT with the ensuing welter of proposed remedies touches Catholics in a vital spot. Catholics have always attached great importance to education. Wherever the Faith takes root schools soon follow. Today a pastor of a new parish scarcely dare build a church in preference to a school if the number of children warrant one and teachers are available. But Catholic education today faces staggering difficulties. A shortage of religious teachers necessitates employing laymen. This expense, added to the upkeep of the school, makes the financial burden onerous. More reason then, that before admitting any of the many and varied innovations knocking at the educational gate, Catholics should pause and pray for light.

WISDOM OF DROPPING LOWER GRADES

Some reformers advocate the elimination of the first six grades, concentrating on a junior-senior-high-school-junior-college system. They go so far as to predict that the time is near when this set-up will be normal for Catholic schools. Assuredly the number of junior colleges dotting the nation indicates that they have become an important part of American higher education.

> There are 677 junior colleges in the United States. They enroll a total of 905,000 regular and part-time students; they employ the brains and skills of 24,000 teachers most of whom have M.A.'s and Ph.D.'s. One student in every four now begins his program of higher education in a junior college. By 1975, when the flood tide of students swells to its crest, predictions are that the rate will be one in every two.[1]

In defense of the junior college no less an authority than M. M. Chambers states:

> . . . it is clear that the two-year local junior college has a function of enormous importance — to provide the first

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[1] Andrew Hamilton, "There's a Junior College in Your Future," *Think*, XXX (September, 1960).

> two years of education beyond the high school for the swiftly increasing numbers of competent high-school graduates in the home community, some of whom would be barred from higher education by financial inability if the junior college were not at hand. . . . [It] can give more than satisfactory preparation for further higher education, . . . and can also offer suitably varied terminal, two-year courses for students who will go no further. These can include vocational and technical instruction suited to the wants of industry in the locality, in addition to liberal and general education designed as immediate preparation for good citizenship in the workaday world rather than for advanced university studies.[2]

Though such a system has strong features and necessity might well force its adoption, it is not ideal. If children can not come under Catholic influence at all levels of instruction, it is more important to provide this advantage for adolescents, and the junior college means two more years of guidance at this critical period. However, maintaining two years of college at a creditable academic level (anything less would defeat its purpose) is scarcely less expensive than maintaining the six lower grades. Providing classroom facilities, standard equipment, and qualified teachers would mean a considerable outlay of money. It seems doubtful, therefore, that the change would be economically justified.

VALUE OF CUTTING OUT SMALL COLLEGES

Donald McDonald proposes the elimination of the small Catholic colleges and concentration in the larger ones. He contends that "the proliferation of Catholic colleges invites a dangerous thinning of teaching and research staffs."[3] This is the view of the man on the mountain top who can not appreciate, because he does not know, the resources and views of the valley. To eliminate the small Catholic college is to deprive thousands of 18-to-21-year-olds of the privilege of higher education. Nearness to home, smaller fees, and curriculums adapted to the needs of the students make the small college desirable. That they invite a dangerous thinning of the teaching staff is yet to be proved. The size of the staff does not

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[2] M. M. Chambers, "Diversify the Colleges," *The Journal of Higher Education,* XLIV (January, 1960), 12-13.

[3] Donald McDonald, "Can We Keep on Paying for Catholic Schools?" *America,* CXIX (March 26, 1960), 760-761.

measure the quality of the teaching. All of us have had classes in large universities, both state and Catholic whose faculties numbered in the hundreds but in which the instruction was as thin as the proverbial Emperor's clothes.

Moreover, smaller colleges offer advantages not found in large schools. Contact between professor and student is closer and guidance is more effective. In the friendly atmosphere of the small school is salvaged many a capable student who did not take his high-school work seriously or who came from a school with a limited curriculum. These students would be lost in the anonymity of a large institution whose impersonal attitude toward the student is "sink or swim by your own talent and labor." But it is the job of the school *at all levels* to help the students increase their fund of worth-while knowledge, train their intellectual and cultural tastes, and stimulate and guide their ambitions. Left to themselves, young people are prone to succumb to the many distractions on the campus and only sip from the fountains of learning.

RESEARCH AND EFFECTIVE TEACHING

True, publicized research is not found in so great measure in small colleges. These are likely not to be equipped with facilities for extensive or intensive research that makes the headlines. But the teacher's primary function is to impart knowledge and stimulate thought, and research per se is not the mark of excellence in this art. The learned professor who is engaged in research is prone to put his project before his job or drag it into class though it is irrelevant to the work at hand. As one critic observes,

> There has grown up the belief that research is indicative of an inquiring mind and that this same mind is the one most likely to stimulate students. This belief needs to be probed. Further evidence should be accumulated as to whether or not teachers who do research relate it to what is important to students. Too frequently the researcher believes that since his work is important to him, it must be relevant in the lives of students. The prevalence of this belief and its validity ought to be examined.[4]

[4] Lewis B. Mayhem, "The Relationship of Instruction to Accreditation," *Junior College Journal*, XXX (December, 1959), 190.

Furthermore, research is not confined to the laboratory, and sometimes the results are too intangible for publication. For research is only continuing scholarship however it is attained or exhibited. Two centuries ago Alexander Pope warned that "a little learning is a dangerous thing." Every teacher has the duty continuously and earnestly to lessen this danger by research. A researching professor's efforts to inspire his students with a love for learning will be effective. If he himself experiences the joy and stimulation of learning new things, his students will absorb his enthusiasm and will be convinced that learning is important. From his own failures and successes will come an understanding of their struggles and difficulties.

One form of research available to all is reading. Professional reading should be on every teacher's daily agenda. Not to read is blameworthy and inexcusable in a teacher. If he is to be an educator, not a mere instructor, he needs a wholesome curiosity about people, about teaching and its tools, about recent findings in his own and related fields, as well as in the world about him. Reading satisfies this curiosity. More, it broadens his views, gives variety to his knowledge, and sparks his personality. The teacher who reads widely need not rely on knowledge gained once-upon-a-time, or teach from notes now threadbare from usage. His teaching will be not so much supplying answers to questions as giving questions to be answered. Not to read is to remain intellectually and professionally static. "Reading maketh a full man," and only such should presume to guide others through the realms of wisdom.

THE THREE-TERM COLLEGE

Another proposed reform is a three-term school year of real academic work and no "frills." The three terms, approximately fifteen weeks each, would be interspersed with short vacations. Certainly such a system has merit. Serious study of un-"simplified" history and languages including English, un-"applied" mathematics and sciences would mean a more comprehensive grasp of these subjects and greater mental discipline. A three-term year would enable students to finish sooner and start their careers at an earlier age. Teachers, too, would profit. Those who now pursue their studies in six- and eight-week summer sessions would have to be released for one of the fifteen-week terms.

But how determine what constitutes "frills"? Classicists would include such courses as shop, driver's education, homemaking, dramatics. Yet few will deny that these courses can contribute immeasurably to the end of education—to fit the student for living. Others deplore the overemphasis on athletics. Though some schools do glorify the athlete more than the scholar, athletics has a place in the curriculum. Nor is it the whole truth to say that non-athletes are better students and the kind the school wants. Athletes are likely to be men of brains as well as brawn. Moreover, the athletic department can be and often is a powerful advertisement for the school. Boys (and girls) are often attracted to a school through its athletes. In short, before schools can drop the athletic program or radically de-emphasize its importance, the American public will have to be educated to the change. And schools can maintain good public relations only by synchronizing principles of sound education with popular opinion.

THE TEACHER-EXCHANGE PLAN

Another trend that is gaining momentum is the exchange policy. Neighboring colleges "borrow and lend" instructors and sometimes combine classes. Where the colleges are not within commuting distance an instructor from one is exchanged for an instructor from another, either in the same or a different department. This practice has long been in vogue in the summer; more recently it is being used for the regular term. Public and private interest in international cultural and educational activities prompts the teacher exchange at the international level also.

The principle underlying this policy is that a teacher from outside will bring new blood to the school and in return will receive a like transfusion. The experience of working in another system should extend the teacher's professional outlook. To what extent he will contribute new blood depends upon the status accorded him by the new school. If he is accepted on a basis of equality and permitted to participate in school projects, his contribution will likely be worth while. But if he enjoys only the status of an indentured servant with no voice in proceedings, there will be no exchange of ideas and the aim of the venture will be frustrated. Only circulating blood is functional.

EMPHASIS ON EXCELLENCE

The distinguishing mark of the Catholic school is the supposed emphasis on character training. The late Pope Pius XII declared officially what we all know but sometimes seem to lose sight of: "The Christian school will justify its existence in so far as its teachers . . . succeed in forming staunch Christians." This goal is achieved, he said not only "through religion courses and practices of piety" but through "exterior organization and discipline." If no standards of scholarship are maintained, failing students is discouraged, those who plainly are not college timber are dragged along, excessive absence and tardiness condoned, not much character training is given. Administrators who subscribe to these policies are not promoting the Christian education of youth, and the school is doing nothing for the student that the public school does not do. The workaday world demands punctuality and competence, and those who fail to meet the requirements are dismissed. Education which does not insist on these marks of efficiency is not fitting the student for living.

The focal point of the many remedies offered for our education malady is this year's slogan chosen by the National Catholic Educational Association, "Emphasis on Excellence." This excellence does not mean buildings, trophies, or honorable mentions though these awards might be tangible evidence of high standards. Nor does it mean only improving standards and procedures. It means progress beyond old frontiers. It means that we hold before our students high standards in values, conduct and accomplishment and insist that each student meet these standards according to his ability. Since we are all creatures of environment and respond to our intellectual climate, every school whatever its level of instruction should establish an atmosphere of excellence. If school policies make clear to faculty and students that they are expected to give evidence of intellectual growth, they are likely to do so.

A troublesome by-product of learning and teaching is grading. Conceivably, everyone would be happier if we had some other way to assess a student's accomplishment. True, grades are not everything but they are important. They are a big factor with boards of admissions, employers, and personnel managers in deciding whom to accept and whom to reject. On grades, then, depends largely the first step toward success. What should be the criteria for judging

grades? Probably no infallible norms will ever be devised because of individual difference in interpreting them. In general it is conceded that A is for the superior student, B for the very good, and C for the average; but individual differences operate in determining what places a student in any one of these categories. Though theoretically we admit that most students are average, we somehow feel that it is to our credit that we have many A's and B's. In reality more than 50 per cent in the upper brackets should be a danger signal. Too generous grading can cause harm. If the English or history teacher is hard put to give a student a C, the language or mathematics instructor's B to the same student is questionable. Again, a small college makes much of a student's intelligence and graduates him with high honors. He enters the university for graduate work in the same field and flunks out. Obviously, something was wrong in either school with the grade norms or their interpretation.

But whatever the norms, whatever the individual instructor's interpretation of them, his grade must stand. Presumably it is based on the teacher's own instruments of teaching and in that case he is the best judge of how the student has responded. That is not to say that professors are infallible and that administrators or students may not question grades. Perhaps the instructor *is* in error. If he is, he he will no doubt graciously rectify his mistake. But ethics require that no grade be changed without the teacher's knowledge and consent.

Education is a complex business. In their anxiety over the present chaotic situation and in their eagerness to remedy it, American educationists, like Aeolis releasing the winds, rush forth with potential cure-alls. Catholics with a bonded interest in education and a wholesome awareness of their limited resources can not permit an inrush of innovations. In considering the many proposed remedies they must move cautiously.

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Two more parishes announced last month the introduction of the scriptural practice of tithing. One is St. Agnes Parish, Cleveland, whose pastor is Auxiliary Bishop Floyd L. Begin; the other is St. Louis Parish, Louisville, Ohio. According to the plan, parishioners give 10 per cent of their total income to the Church. The tithing plan is used in several parishes of the Diocese of Mobile.

TEACHING INTERGROUP UNDERSTANDING IN CATHOLIC SCHOOLS

By Khalil Gezi*

THE PURPOSE of the present article is to analyze the causes of intergroup friction and prejudice and the methods by which Catholic schools can teach and foster intergroup understanding.

WHY INTERGROUP UNDERSTANDING

Catholic schools should teach intergroup understanding for many reasons. Though many of these reasons are obvious, a repetition here would serve to emphasize our obligation to develop sound attitudes in our students regarding their fellow men and women regardless of their ethnic, racial or religious background. Here are these reasons. First, Catholics adhere to the natural law. All men are created equal, and all have the right to live with dignity as human beings. Catholics have a sacred duty to understand the full meaning and implications of the natural law in their daily living with various groups of people. Second, the Catholic Church is a universal church. It has attracted people from various national and ethnic groups. So, while the Church opens its doors to the faithful from every group, and while the Church is proud of all its followers, those who profess faith in the Catholic Church should follow the example of this Church. They should open their minds to objective facts about other groups and should strive to understand and respect the subcultures of these groups. Third, we live in a democracy which upholds the equality of all people as human beings under the law. If Catholic students are to be brought up as good citizens who understand and defend their democratic way of life, they should be taught the ideals and attitudes that underlie democracy. Fourth, a nation such as the United States can become stronger if all its citizens are united in harmony and good will. The need for unity is even more important now that the Communists threaten to enslave the whole world. Fifth, some Americans used to, and still do, regard the Catholics in America as a minority group and talk about Catholics in unfair terms. If Catholics are unhappy to find bigotry

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and prejudice leveled against them, Catholics should be equally unhappy to find bigotry and prejudice directed against any other group. Catholics should be encouraged to understand and sympathize with the feelings of other groups and to accord them the respect due to them as human beings.

CAUSES OF INTERGROUP PREJUDICE

The word "prejudice" is employed here to refer to an expression of a negative state of psychological orientation. In order that one may fight prejudice effectively, one must understand its deep-rooted causes. Although each case of prejudice may be a unique one, and, therefore, must be treated and analyzed separately, certain "assertions" can be formulated concerning the forces that develop prejudice. From research in the field of social psychology, one is able to state the main "correlates" of prejudice under the following headings:

Personality factors.—Many investigators have conducted studies to determine whether there is any correlation between prejudice and personality structure. Mussen, in his study of the effect of personality and social factors on changes in children's attitudes toward Negroes, reported that closer correlation existed between scoring high on an anti-Negro prejudice scale on one hand and both the expression of aggression and dominance and the feeling of hostility toward parents on the other hand.[1] Alport and Kramer, in their study of the roots of prejudice, concluded that feelings of victimization in many of their prejudiced subjects were coupled with a jungle philosophy of life.[2]

In summation, personality factors such as being mentally retarded or emotionally unstable may contribute to the formation of generalizations and attitudes which can not be verified by reason. Aggression, as a manifestation of such unstable mentality, may be directed against various people including those from minority groups.

Social and economic insecurity.—The misplacement of frustrations caused by social and economic insecurity may fall upon a certain minority group as an outlet for these frustrations. A survey of history

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[1] Paul A. Mussen, "Some Personality and Social Factors Related to Changes in Children's Attitudes Toward Negroes," *Journal of Abnormal and Social Psychology,* XLV (July, 1950), 423-441.

[2] Gordon W. Alport and Bernard M. Kramer, "Some Roots of Prejudice," *The Journal of Psychology,* XXII (January, 1946), 9-39.

would verify the fact that certain minority groups were made "scapegoats" on whom all the blame was put for the evils which befell upon the majority. Hitler's prosecution of the Jews is a recent example. Many studies in the field of social psychology tend to give evidence to the influence of social and economic insecurity of the group on the formation of their prejudices against a minority group. Watson, in her study of certain situations relating to attitude changes, found that economic difficulties were correlated with greater hostility against the outgroup.[3] Westie's study of social distance between whites and Negroes revealed that social distance was greatest where both whites and Negroes were of low economic status.[4] It seemed that social and economic deprivation of the white group here had to be blamed upon some other group such as the Negroes in this case. Bettelheim and Janovitz discovered that prejudice is not determined by economic status per se, but that a downward social mobility (which is a cause of social insecurity) was positively correlated with the intensity of prejudice.[5]

Educational factors.—Evidence, though not without some dissent, reveals that there is a rather low but somewhat significant association between low educational level and prejudice. Gough, in his studies of school intolerance, found that his prejudiced subjects were very inferior in their academic work as well as in their intelligence tests.[6]

A person with a low educational level can be led to believe what he hears without the benefit of objective knowledge to verify what he hears. Such a person may be more prone to generalize from isolated experiences, and to accept the stereotypes of others because of apathy and lack of intellectual curiosity aside from the lack of basic relevant facts regarding generalizations and stereotypes.

Socio-cultural factors.—Reference groups have a remarkable influence on the attitudes of the individual. We call a group our reference group when we identify ourselves with it and adhere to its aspirations and modes of conduct. An individual's reference group

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[3] Jeanne Watson, "Some Social and Psychological Situations Related to Change in Attitudes," *Human Relations,* III (February, 1950), 15-56.

[4] Frank R. Westie, "Negro-White Status Differentials and Social Distance," *American Sociological Review,* XVII (October, 1952), 550-558.

[5] Bruno Bettelheim and Morris Janovitz, *Dynamics of Prejudice* (New York: Harper and Brothers, 1950).

[6] Harrison G. Gough, "Studies of School Intolerance, I-IV," *Journal of Social Psychology,* XXXIII (May, 1951), 237-269.

may be the immediate family, the teen-age clique, the class members, an organization or a special club.

Since the individual aspires to be accepted in his own reference group, he finds it imperative for him to confirm their methods and goals and to conform to their climate of opinion. Therefore, an individual may inherit or grow to accept certain prejudices as part of the climate of opinion of his reference group. The impressive story of the little boy who asked his mother whether he could invite home his friend "Charlie" is relevant here. When the boy's mother asked her son whether "Charlie" was a white or a negro, the boy answered that he had not looked. The mother insisted that he should look the following day and that he is to play with whites only. The mother in this case was responsible for attracting the attention of her son to recognize a difference which he would not have noticed otherwise. She taught her son to attach a great significance to color. This is the first step in building prejudice.

SCHOOL'S ROLE IN PROMOTING INTERGROUP UNDERSTANDING

The school must be viewed as an agency which the Church or the State has set up deliberately in order to transmit certain facts and to develop certain skills and attitudes which enable the individual to effectively live and work in his society. The school, therefore, is a part of his society. It is a midget society and its culture stems from the dominant culture of the large society around it. If the school's society and culture are dominated by prejudices and stereotypes, the school is not likely to succeed in its effort to achieve intergroup understanding. The school must provide its students with all the opportunities to live according to the basic tenets of Christianity and democracy which underlie the structure of American society. Therefore, if the school intends to direct the behavior of its students toward the goal of intergroup harmony, it should first see to it that its organization, its administrators and faculty, its rules and regulations, and its policies are not discriminatory to the attainment of the goal of intergroup understanding and unity.

In order to implement this goal, here are some specific suggestions for the administrator and the teacher. (1) Faculty members should themselves be living models who can demonstrate by their own behavior sound attitudes of intergroup understanding. (2) Teachers should provide objective facts regarding intergroup problems and

develop good thinking habits on the part of their students. (3) The school should provide pleasant opportunities for interaction among all the students and especially those from a minority group. Increased familiarity with an attitude object tends to change this attitude (a) when it is weak, (b) when no attitudes are prevalent and (c) when the nature of the contact is desirable. (4) In specific subjects such as Religion, History, Civics, Sociology, Guidance and Senior Problems, teachers can expose bigotry and discrimination as manifestations of moral bankruptcy, as violations of the tenets of Christianity and American democracy and as emotional attitudes that are not supported by objective facts or scientific research. (5) Teachers must encourage intelligent appraisal of current events, articles and books concerning intergroup relations using the relevant facts needed for a sound appraisal. (6) Teachers must develop in their students strong attitudes of justice and fair play so that students would grow to oppose vigorously unfair comments and practices regarding other groups in the classroom and in the community. (7) School government must be open to all students and must demonstrate its leadership in dealing with problems involving all students in a spirit of brotherhood and justice. (8) Teachers must explain the emotional effects of prejudice on members of the minority group as well as the majority group. (9) Teachers should insist that all students be sensitive to, and considerate of other people's feelings and opinions. (10) Administrators and teachers should consider carefully the problem of textbook selection. Textbooks should not in any way strengthen stereotypes, present false images of certain people or evoke emotional reactions against these people. A survey sponsored by the American Council on Education reported many stereotyped descriptions attached to such groups as "immigrants," "Negroes," "Jews," "Japanese," and "Chinese" in textbooks used in many American schools.[7] Such stereotypes about minority groups tend to lend the student distorted images of these groups and lead to strengthening certain negative attitudinal responses. (11) Teachers can show the contributions to the American culture of persons belonging to minority groups along with others from the majority groups. (12) Administrators and teachers must improve the school's relations with the different groups in its community.

[7] Maxwell S. Stewart, *Prejudice in Textbooks* (Washington, D. C.: Public Affairs Committee, Inc., 1950).

LET'S LEARN GRAMMAR BEFORE HIGH SCHOOL

By Sister Mary Vianney, S.S.J.*

WITHIN THE PAST TWO YEARS such nonprofessional magazines as *Harper's, The Atlantic, America,* and others have run articles deploring the inability of students to express their ideas properly in the English language. This complaint is not limited to college teachers who find even the more intelligent students lacking a knowledge of English fundamentals. No, executives, political leaders, employers, and others in all walks of life have expressed these views. The fact that the College Entrance Examination Board has now added written composition to its examinations indicates that this weakness in the English program has now moved out of the field of mere opinion.

To this I should like to add my own basic observations drawn from twenty-five years of teaching English grammar and Latin. The two big drawbacks in the elementary and high schools are that the high-school English curriculum is overloaded and that fundamentals of grammar are not learned in the first eight grades as they can and should be.

NOT THE WORK OF THE HIGH SCHOOL

To begin, the teaching of language fundamentals is neither the work of the college nor senior high school. If it were, where would the high-school English teacher find time to cover the required units of literature, speech, drama, composition, and journalism. Besides going over all of this material with a TV-conscious generation, the same teacher is often librarian, yearbook and school paper adviser, and is called upon to help with dramatics and every contest which civic and religious groups thrust upon the school. If she wishes to be at all effective, she will have to pause for a brief analysis of her situation and make two decisions: one, that she will concentrate on the most important tasks and subordinate the others; two, that she will not keep reviewing and repeating elementary material for the sake of the slow and mediocre, but will gauge her work to the average and above who might otherwise be the real losers.

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Some ideal answers to her problems are demonstrated by schools with larger enrollments and better facilities than most. The first is to have two required English classes for each grade, one for an intensive study of literature and the other for grammar and composition. This would provide ample time for the mastery of reading, writing, and oral expression. The second, more common, is sectioning. Students of better ability and achievement are placed in classes different from those requiring remedial work. Thus far the best most teachers can do now with pupils of varying abilities is to take the advice of a silver jubilarian English and Latin teacher: "Teach the ones who have come to learn." One can scarcely blame a junior or senior for boredom when his English classes consist of little more than what he already learned in a previous grade. The third solution would be small classes so each child can be helped individually and the teacher be given more time for correcting written work. There is practically no value in assigning a theme which is neither corrected nor rewritten.

Despite these remedies, the best answer can and should come from the elementary school. All fundamentals of grammar should be completed by the end of the eighth grade. This includes parts of speech, all types of sentences, punctuation, and skill in writing a brief letter or simple paragraph. This is possible as evidenced by elementary schools of the past and present. Some of the best English teachers in our community were trained in this fashion thirty, twenty, and ten years ago. Now they are doing their utmost to maintain the same standards. Four years ago we noticed that Catholic students who transferred to us from a public junior high school showed uniform excellent training in grammar. When asked the name of their teacher they gave the name of a Catholic gentleman who was a graduate of a parochial high school and had spent eight years in a diocesan seminary. He had acquired and given his students respect for a correct, accurate knowledge of language skills which was to help them for the rest of their lives. This same public school offered Latin as an elective for eighth-graders and the majority had taken two semesters.

BETTER ACCEPTANCE AMONG THE YOUNG

Psychologically, grammar is easier for younger children to learn. Personal experience with fifth-, sixth-, and seventh-grade children showed my confreres and me how much more impressionable they

are than the pragmatic teen-ager who rejects a fact for which he cannot see any immediate, practical use. The adolescent eighth-grade child does his more difficult grammar and continues to like the class because of the proper preparation in the preceding years. Generally speaking, we have found it next to impossible to teach grammar to high-school students "from scratch." They are more set in their ways and see no sense in going through all that hard work to speak and write correctly when the guide, "It sounds right," is so much simpler. Younger children accept grammar unquestioningly, delight in using the new terms, in drawing the colorful diagram lines with pencil and ruler and retain the fundamentals better.

The second-grade teachers who develop "sentence sense" actually begin the grammar. The little ones learn the composition of a complete thought, compose simple sentences with periods and question marks, and express themselves orally. By the completion of the fourth grade most are able to recognize a noun, an action word, and a descriptive word called an "adjective." Formal grammar begins in Grade V with the memorization of parts of speech and simple diagraming.

Ah, diagraming! Perhaps we grammarians hurt our cause most by making the diagram an end in itself. Its primary purpose is functional. An authentic example on record is the class of 1926 which could diagram the entire Preamble to the Constitution but had never once been assigned a composition.

The elementary-school plan is not likely to succeed unless the diagram serves the same purpose as the drawings of businessmen on the luncheon tablecloth. The lines appeal to the visual senses; they make word relationships graphic; they help clarify a point the child finds difficult. Often as I correct a student for some construction she will reply, "Sister, perhaps if you diagramed that clause on the board I could *see* what you mean." Diagraming is logical and develops clear thinking. Boys especially enjoy diagrams because they are concrete, specific, and stress accuracy.

So much for diagrams, but once a point of grammar is learned the practical application in speech and writing should be a *sine qua non* of the exercise. Few students are mature enough to apply these rules in their writing and oral expression without ample drill and guidance from a good teacher. If the child has learned that a linking verb takes a predicate noun, he should be drilled on such usages as, "It is they," "It is we." Once he learns compound

sentences, the rule for correct use of the semicolon should be presented and practiced. The textbook market offers a wide choice of low cost workbooks to supplement the oral and written usage drills of the text.

VALUE OF SHORT WRITTEN EXERCISES

Approximately one written exercise each week also demonstrates the value of grammar. Even third- and fourth-grade children can produce a one-page paragraph or brief letter. Perhaps our limiting the creative expression to "one page, one side" of a sheet of paper will make the artistic cringe, but the brief paper has more chance of getting corrected by the busy teacher. Furthermore, this lessens the errors and the child is not so easily discouraged by revising and rewriting a shorter paper. Numerous collegiate English problems and bad habits would be eliminated if the elementary-school and high-school teachers could do more of this correcting and the students more rewriting. The mental discipline of doing a task over until it's done right is one of the sadly neglected areas in our training of today's students. The English teacher has a splendid opportunity to inculcate this habit in her students. When Willy realizes that if he understood participles he wouldn't be so apt to substitute a participial phrase for a sentence nor to have dangling participles, he will see that grammar has something in it for him, after all.

Parents we meet lead us to believe that a more intensive program of grammar would be enthusiastically endorsed by them. They comment favorably when the child brings home from three to five sentences for parsing and diagraming. Some of our Catholic schools have non-Catholics waiting for admission so they can get a better foundation in Latin and grammar. If and when the day dawns when *all* schools begin grammar earlier, make the English classes smaller, lessen the burdens of the high-school English teacher, and obtain teachers who are sold on the necessity of grammar, the colleges will finally be able to concentrate on college-level English.

* * *

The Diocese of Peoria was the host to the 1960 national meeting of the diocesan superintendents of schools, October 24 to 27. The meeting was held in Peoria as a tribute to Archbishop John Lancaster Spalding, first Bishop of Peoria, and one of the great names in American Catholic education.

GOOD SOURCES MAKE GOOD COURSES

By Sister Mary Peter, R.S.M.*

COURSES ORIENTED on a single textbook seem like one of the more antiquated features of the little dread schoolhouse to me now, after nine years of teaching in a college where the bibliographic approach is mandatory in every area.

Like the farmer who looked at the giraffe and said, "There ain't no such animal," new students look askance when they are first informed of the policy, and react with downright suspicion after they wind up their first week of classes without having acquired a single textbook in any course. "People are generally down on what they are not up on," as Shaw has remarked.

Visiting educators and new faculty members accept the bibliographic approach concept blandly, presuming it means a policy of emphasis on supplementary and collateral reading. The day it dawns upon them that it means that all students are expected to be acquainted with, not one, but all the major works in their subject field, that the professor frequently faces a class which has in aggregate consulted twenty or thirty different sources to prepare the assigned material, they realize this approach is offsetting the pablum with a bit of roughage in the educational diet.

UNQUALIFIED ENDORSEMENT BY STUDENTS

Thinking and discussion flourish inevitably when many sources are consulted, because, as different points of view come to light, students evaluate their own authorities with the critical objectivity that comes from seeing many facets of an issue. They quickly learn to cite their sources in oral recitation, if only in the spirit of self-defense. "I read somewhere" is flimflam after reputable authorities have established a contrary view.

Student evaluation of the eclectic procedure reveals almost unqualified endorsement. Those who find themselves in textbook-

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oriented courses later on in other colleges find it insufferably confining. Our students' enthusiasm is not spontaneous in the beginning, however. Typically they founder and flounder through their first few weeks; the librarian and the study skills director spend whole days teaching fundamental research attitudes, and no one denies there is a storm-and-stress period wherein every faculty member and every upperclassman with an even slightly sympathetic bent becomes a stand-in for both the librarian and the guidance counselor. But before the first term is finished, students acquire considerable efficiency in library skills; before the year is through, they have compiled their own annotated bibliographies, contributing towards the professor's master source list. It is interesting to watch their growth in documentation: "That huge red tome" gives way to "In Maritain's *Creative Art and Intuition*"; similarly they first identify unfamiliar authors in terms of educational affiliation, but eventually by ideological association. One's outlook brightens perceptibly the day a student makes an observation such as, "Of course the author's whole frame of reference is a 'this-earth' rationale."

Unquestionably the bibliographic policy helps students discern the chaff from the wheat, and precludes warnings and listings of non-acceptable authorities. Students who are accustomed to objective evaluation of ideas do not accept a man's point of view simply because he has written a book or obtained a following. In doing research on their assigned topics they have had firsthand experience with fallacy, and have seen it compare unfavorably with truth under the Roentgen ray of reason.

The library is in fact the heart of the college; first sources and documentary material take on a special value in an atmosphere which invariably involves a hierarchy of acknowledged experts. One is impressed by a commentary until the next student cites the actual work; the lines from the Paradiso extract seem effective until another student quotes them from a superior translation; a psychological study related to the question at hand interests everyone until an alert student summarizes a more recent research report repudiating the original findings. And so it goes. The most desirable sources are kept on reserve, but enterprising students are always canvassing the library and finding new or previously undiscovered treatments in everything from government documents to the latest book or periodical which has just arrived on the shelf.

FRESH APPROACH TO COURSES

A fresh approach to each course is guaranteed, since new editions, journals, and brochures march into every class to challenge both professor and students: new sources make new courses. The individualized assignment is a natural outgrowth of the situation: the student who finds something of value for the group is encouraged to follow up his interest and report on it at a later date, often assisted by a colleague who is likewise curious. Small discussion groups, or buzz sessions, frequently seem the appropriate way of pooling research findings into an organized pattern. Committee work is an automatic adjunct; we never consciously set out to work in small groups, but from the beginning it has been concomitant with the bibliographic approach.

In many ways the policy is a boon, as well as a challenge. It is obviously an impossibility for any professor to keep abreast of everything written in his field, but not many important pronouncements escape him when all that his students read comes back to him from every available source they can locate. If they are properly trained to cite their sources exactly, he can readily pursue the reference he wishes to investigate. One professor, who had been appalled at being unable to assign a favorite standard textbook when he began teaching courses in education with us several years ago, has recently remarked that he doesn't see how anyone could possibly be satisfied to limit a course between the covers of a single textbook. For his part, it seems to him his subject area becomes more comprehensive every year; he wishes there were many more hours in which to complete his course. His students share that sentiment, but this was not always so, and those of us who have watched him improve as a teacher feel he took his leap for excellence the day he relegated that favorite volume to the category of one of many.

One of the remarkable instances that serve as proof for the value of the multitext procedure occurred in a class of British and American poetry. A student mentioned in the course of a discussion that Emily Dickinson is considered second only to Whitman among American poets. Another student challenged the evaluation, citing a source that considered her a minor American poet. In a spirit of fun, we all consulted for comparative criticism the volume or anthology each of us was using. There were no duplicate volumes in a class of forty, and we had a range of classifications for the

nun of Amherst from "the greatest female poet since Sappho" to "an inconsequential dabbler in doggerel-type verse." One of the class thoughtfully commented that if we had been trusting a single editor's critique our literary criticism would be in an unrealistic state of security.

ADAPTING BIBLIOGRAPHIES TO STUDENTS

Under this system which I have been describing, and to which I am obviously an ardent subscriber, students are initiated early and thoroughly with the great minds of all times in each area of learning. Basic to proficiency in each discipline is firsthand familiarity with the great works that constitute our intellectual and cultural heritage. The topical outlines and bibliographies issued to students the opening day of each course indicate the authorities and works with which the student is expected to be familiar before the term is completed. Minimum standards for passing grades must, of course, be articulated to protect the weak student and forestall the reluctant one, because typical bibliographies are challenging to even the most ambitious gifted student. But when broad and beautiful vistas are opened for them, they suddenly sense how little time there is. They say, as one student said only yesterday, "Some of us have been wishing we could spend another year here, just reading and absorbing all we have learned."

* * *

Chaminade College, Honolulu, Hawaii, will start an early admissions program in September, 1961. Qualified students who have completed their junior year in high school will be permitted to enter the College as freshmen.

* * *

Marillac College, Normandy, Missouri, was host, on October 22 and 23, to the Seventeenth Annual Conference of Mother Seton's Daughters. The Conference brought together the Mothers General and the Provincials of the seven religious communities which owe their origin, directly or indirectly, to the heroic life and labors of Mother Seton. The seven communities represent some ten thousand Sisters. Today, these Sisters conduct seven colleges, 110 high schools and academies, and over a thousand elementary schools in practically every diocese in the country, together with a vast network of charitable institutions and hospitals. The object of the Conference is to promote the cause of Mother Seton's canonization; she was declared Venerable in December, 1959.

EVALUATING AND REPORTING CONTRIBUTED SERVICES

By Rev. Edward V. Stanford, O.S.A.*

IT IS THE GENERALLY ACCEPTED practice today to take full account of the contributed services of religious personnel in the financial reports of Catholic universities and colleges. This is the important point. However, there are variations in the methods of reporting these contributed services. A uniform procedure is desirable. The writer suggests the following method.

EVALUATING CONTRIBUTED SERVICES

The college or university business office undoubtedly maintains salary schedules for the lay members of its faculty and for all other lay employees. It should also maintain similar schedules with comparable salaries for all religious who serve the college in any capacity. At the end of the fiscal year the salaries "earned on paper" are totalled to give the gross value of the contributed services for that year. Then the actual cost for the maintenance of these same religious which may be chargeable as a direct college expense is tabulated and added up. This might include such items as clothing, food, housing, retreats, sickness, travel, provincial or motherhouse tax, and the like. This total expense for the religious community is then deducted from the gross value of the contributed services to give the net value of these services to the college or university.

By way of example, let us suppose that the gross value of the contributed services in a college for one year amounts to $250,000, and the total religious community expense for that year amounts to $50,000. Then the net value of the contributed services to the college for that year is $200,000. At a conservative interest rate of 4 per cent, this amount of $200,000 is the equivalent of the income for one year from an endowment fund of $5,000,000.

REPORTING CONTRIBUTED SERVICES

It is my present conviction that these contributed services should appear in the auditor's financial report of a college both on the

* Rev. Edward V. Stanford, O.S.A., Ph.D., of Villanova University, Villanova, Pennsylvania, is a consultant in the Administrative Consultant Service of the Association of American Colleges.

balance sheet and on the detailed statements of expense, but only as footnotes and memoranda.[1] Although the value of these services must be clearly noted on the auditor's report, there is no need to include the figures in the totals of either income or expense.

On the balance sheet I suggest that the contributed services be recorded as a prominent footnote in this fashion:

> For the fiscal year 1959-1960 the services contributed to ..... College by the Sisters of ..... had a gross value of $250,000. After deducting all community and personal expenses of the Sisters amounting to $50,000, the net value to the College of these services was $200,000. At a conservative interest rate of 4 per cent, this amount is the equivalent of the income for one year from an endowment fund of $5,000,000.

In thus reporting, proper account is taken of the value of contributed services without inflating the actual cash position of the college. Whenever a report on endowment is required, comparable to non-Catholic institutions, the necessary information is at hand and it will be a simple matter to include the endowment value of the net contributed services. Both the gross value and the net value of contributed services are also there for use when required.

DETAILED STATEMENTS OF EXPENSE

On the detailed statements of expense a memorandum of the proportionate share of gross contributed services should be shown where applicable under each separate heading of itemized expenses, such as, cafeteria, maintenance of grounds and buildings, administration, instruction, library, and so on.

Let us take the library as an illustration. Suppose that two religious are engaged full time in the library and that the salaries for lay persons of comparable competence would be $6,000 and $4,000 respectively, a total of $10,000. This total is the value of the contributed services to the library. It should be recorded in the auditor's report under library expenses as follows:

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[1] This represents a change in the writer's attitude. See Edward V. Stanford, O.S.A., "Living Endowment of Catholic Colleges," *The Catholic Educational Review*, XXXV (April, 1937), 216-225.

Library Expenses

Salaries	$3,500.00
Books purchased	2,000.00
Periodicals	800.00
Binding	400.00
Supplies and expenses	500.00
Total	$7,200.00

(Value of contributed services to Library — $10,000.00.)

From these figures one can see at a glance both the actual cash expenditures for the library and the value of contributed services to the library. When reports of library expenses are required, comparable to non-Catholic institutions, for the American Library Association, an accrediting agency, or any other agency, it will be a simple matter to report as follows:

Library Expenses

Salaries, including contributed services	$13,500.00
Books purchased	2,000.00
Periodicals	800.00
Binding	400.00
Supplies and expenses	500.00
Total	$17,200.00

It should be noted that only the gross value of the contributed services is used in the examples given above. If the net value of these contributed services were used, the result would not be truly comparable to the college with only salaried lay employees. For a similar reason, whenever it is necessary to report on a comparable basis the total payroll of the college, or its academic payroll, the figures for the gross value of contributed services should be used.

Whenever contributed services are applicable, whether in administration, instruction, bookstore, cafeteria, maintenance, or anything else, the statements of expense for each should be treated in the manner illustrated above for the library.

* * *

The Golden Anniversary Convention of The National Council of Teachers of English will be held, November 24 to 26, in Chicago, at the Morrison Hotel and the Palmer House.

THE CATHOLIC UNIVERSITY RESEARCH ABSTRACTS*

THE FUSION OF DISCIPLINE AND COUNSELING FUNCTIONS AT THE COLLEGE LEVEL by Concepcion F. Rodil, Ph.D.

This study aimed to investigate the various situations in which discipline and counseling as related functions are administered, the factors that enter into these situations, and the ways by which their administration can best be achieved.

The method of study consisted of personal interviews with 17 student personnel workers of 11 higher institutions of learning and of a questionnaire study participated in by 423 students, 177 instructors, and 102 personnel workers of 22 colleges and universities of various types in different regions in the United States.

The findings indicate that the majority of student personnel workers approve of the concept of discipline of their institutions and the disciplinary measures used, but they do not like to be associated with discipline. In small institutions, however, the functions of counseling and discipline are fused in one person. In general, harmonious relationships exist among various offices and among academic and personnel staffs and parents regarding administration of discipline and counseling. Among the students, the "person" and not the office is the first consideration in their attitude towards going to a personnel worker in charge of each function.

THE VOCABULARY OF GENERAL SCIENCE AT THE EIGHTH-GRADE LEVEL by Sister Mary Ambrose Didier, O.S.F., Ph.D.

The purposes of this study were: (1) to determine the basic concept vocabulary of general science at the eighth grade level, (2) to construct a standardized test of this content, and (3) to construct a pupil wordbook in the content of science for the eighth grade.

The vocabulary of science was determined by a frequency count of the most widely used science textbooks of Catholic parochial schools in the United States.

The vocabulary test in two equivalent forms was standardized on

* Published Ph.D. dissertations, either in their entirety or in abstract form, may be obtained from The Catholic University of America Press. Microfilms of M.A. dissertations may be obtained through the interlibrary loan department of the University; information on costs will be sent on request.

a two-stage probability sample of 4,000 students in the eighth grade of Catholic parochial schools in the United States. The two forms of the test have a reliability coefficient ranging from .80 to .94. Norms for the test are expressed as percentiles.

The wordbook, intended as a self-help tool in the hands of the student, defines the terms of the selected vocabulary and gives an example or explanation to clarify the concept involved.

A FOLLOW-UP STUDY OF THE GRADUATES OF ASSUMPTION COLLEGE, 1930-1956, INCLUSIVE, by John L. Moylan, M.A.

The purpose of this study is to ascertain the contribution that Assumption College, a small bilingual liberal arts college, has made to the vocational success of its graduates.

The study showed that 58 per cent of the 312 responding alumni are in professional occupations and that approximately 79 per cent of these alumni have not changed vocations or types of work since their graduation. Philosophy, languages, sciences, and mathematics are the subjects which proved to be the most useful to the responding graduates. The knowledge of French was helpful to 86 per cent of them.

To improve the vocational guidance program at Assumption College the alumni suggested a formal guidance program in which individual attention is given to each student by faculty counselors.

A COMPARATIVE STUDY OF THE MUSICAL INTERESTS — JAZZ AND CLASSICAL — OF COLLEGE STUDENTS IN MUSIC WITH IMPLICATIONS FOR THE GUIDANCE PROGRAM by Charles A. Suhor, M.A.

This study was conducted in order to determine whether an interest in jazz is detrimental to the ends of good musicianship, high scholarship, and well-rounded interests in college music students.

A questionnaire was prepared and submitted to 238 music majors in six universities.

It was found that the students with a primary or secondary interest in jazz scored higher on the Seashore Music Test; reported in general greater experience in musical arranging, composition, teaching, and performance; showed higher grades in both academic and music subjects; stated the intention of working in a wider variety of musical fields upon graduating; and showed greater familiarity with important artists in contemporary classical music and jazz.

A CRITICAL ANALYSIS OF PRINCIPLES OF DEMOCRATIC ADMINISTRATION FOUND IN THE WRITINGS OF POPE LEO XIII by William J. Fleming, M.A.

This dissertation is concerned with the answer to the question: Can the philosophy of the Catholic Church coexist with democratic principles of administration? In order to answer this question, the writer first determines the nature of democratic principles by codifying the principles set forth in modern manuals of educational administration. Having done this, he analyzes them by means of a comparison with administration principles found in the writings of Pope Leo XIII.

The writer concludes that there is no great dichotomy between the principles of administration as expressed by professional educators and those of the Catholic Church as expressed by Pope Leo XIII. Pope Leo, however, consistently reduces the principles to their causes in the natural law and ultimately to their foundation in a Supreme Being, while the educators stop short of the supernatural and justify their position by means of pragmatic and naturalistic philosophies.

A STUDY OF THE PROBLEMS OF A SELECTED NUMBER OF HIGH-SCHOOL STUDENTS AS MEASURED BY THE SRA "YOUTH INVENTORY" by Sister M. Fidelis Barragan, R.S.M., M.A.

The purpose of this study was to explore by means of the Science Research Associates' "Youth Inventory" the problems which most frequently confront students of a selected number of Catholic high schools and to compare these data with those obtained by Remmers on Catholic students in public high schools.

The SRA "Youth Inventory" was administered to 865 students in five Catholic secondary day schools in Georgia, Florida, and Alabama.

The findings of the study are: (1) The three areas representing the greatest number of problems were vocational, personal and social for all students except senior boys who rated scholastic problems higher than social problems. (2) The three areas in which the least number of problems occurred for seniors were home and family, health, and things in general; for juniors, health, things in general, and boy-girl relationship; for sophomores, health, things in general,

and home and family; for freshmen, health, things in general, and boy-girl relationship.

When the answers given by the students in the five Catholic high schools were compared with those given by the students in Remmers' study, there were only a few differences that were significant at the one per cent level of confidence.

THE ATTITUDE OF HIGH-SCHOOL SENIOR BOYS TOWARD CERTAIN LEADERSHIP TRAITS by Rev. Daniel Lynch, M.A.

A STUDY OF THE ATTITUDE OF HIGH-SCHOOL SENIOR GIRLS TOWARD VARIOUS LEADERSHIP TRAITS by Rev. Gerald F. Lyon, M.A.

These studies were undertaken in an effort to construct a rating scale to measure leadership traits in high-school senior boys and girls. Thurstone's rank-order method was used in the construction of the rating scale.

Statements indicative of varying degrees of leadership traits were obtained from twelve senior high-school boys and girls and from literature in the field. A total of 108 statements was obtaincd. These statements were sorted by twenty-five judges into eleven groups representing a graduated series of leadership characteristics.

Quartile deviations were figured to determine areas of greatest agreement among the judges. On the basis of the quartile and scale values twenty statements were selected, ten for each form of the scale.

To determine the reliability of both scales over ninety senior boys and girls were each judged respectively by three other senior boys and girls. The mean score for each judge on each form was found. The Pearson product-moment method of determining the coefficient of correlation was used. The correlation for the two forms was .73. The Spearman-Brown formula for predicting the reliability of a scale of doubled length indicated a reliability of .84.

PREPARATION OF A TEACHER'S MANUAL FOR SEVENTH-GRADE RELIGION by Sister Mary Michael O'Shaughnessy, O.P., M.A.

This dissertation explains those areas of teaching that deal with the goals of education and presents the material required by the seventh-grade religion program of the Archdiocese of New Orleans in expanded form.

The research enabled the writer to conclude that most modern educational psychologists agree on a three-fold approach to learning: the cognitive, the affective, and the volitional. The teacher's manual which the writer presents in this dissertation is directed toward helping the educator to be conscious of this triple distinction.

HOME-SCHOOL CO-OPERATION: A STUDY OF PRACTICES IN RELATIONSHIP TO THE RELIGIOUS AND SOCIO-ECONOMIC BACKGROUND OF THE PUPILS IN THE KINDERGARTEN AND FIRST GRADES by Sister Marie Carmel Janke, O.P., M.A.

In this study a survey was made of present procedures in home-school co-operation in relationship to the socio-economic background of kindergarten and first-grade pupils and the family background.

The investigator constructed a questionnaire designed to elicit from teachers data on home-school co-operation. The questionnaire was sent to twelve selected schools in four geographical areas.

The resultant data from the questionnaires, which covered the families of 720 children in the kindergartens and first grades, revealed that 20 per cent of the children came from homes in which only one parent was a Catholic. The socio-economic background of the families reflected marked differences according to geographical areas. In the analysis of the responses of the individual school it was evident that each school has specific problems and needs.

A SURVEY OF THE NON-CLASSROOM ACTIVITIES OF THE TEACHER AS A MEMBER OF THE COMMUNITY by Catharine Gallagher, M.A.

This is a study of the teachers' participation in community affairs in the State of West Virginia. The findings were procured from questionnaires sent to public school principals and teachers.

This study revealed that teachers in West Virginia demonstrate a sacrificing spirit in community service. Organizations to which they belonged and in whose activities they spent many hours were those which have long been known for their service to mankind. Outstanding among these were the youth-serving organizations in which teachers utilized their training and experience through guidance, supervisory and leadership services. Among benefits that teachers derive from these activities are self-satisfaction from services rendered to the community, cultural, social and recreational opportunities, and a spiritual enrichment of their lives.

HIGHER EDUCATION NOTES

The Catholic University of America Alumni Association will award its Gibbons Medal to Professor Karl F. Herzfeld, head of the University's Department of Physics, at its homecoming banquet, November 12. The award is given by the Association to a person who is judged to have made "an outstanding contribution to the United States of America, the Catholic Church, or The Catholic University of America." Professor Herzfeld, a member of the University faculty since 1936, as a native of Vienna. He taught at the Universities of Munich and Vienna before coming to the United States in 1926. He has made many contributions to the field of physics and has co-operated in several Government projects designed to improve national defense. He is a member of the National Academy of Sciences and of other scientific and cultural organizations.

Research in identifying the components by which the degree of change in college student personality, character, and values may be ascertained is summarized in a booklet entitled *Impact of College*, published recently by the U. S. Office of Education. It indicates the contributions made by recent studies to understanding of the factors influencing these changes during the student years. It also permits estimates of the extent to which life patterns may be altered by attendance at college. The research cited indicates: (1) Compared with freshmen, seniors generally have greater knowledge of their cultural heritage; more cultivated tastes and interests; increased attitudes of skepticism and criticism; but also increased tolerance, differentiation, and mastery of control. On the other hand, seniors evidence decreased authoritarianism and conventionality; decreased stereotypy in perception of roles; and decreased stability, possibly because of impending entrance into a life of broadened responsibilities. (2) Critical thinking ability and changes in attitudes and values are usually caught rather than taught. Student culture and teacher personality play more important roles than specific attempts to teach critical thinking techniques. (3) Throughout their later life, the outlooks of those who have attended college tend to correspond closely to the student culture of which they were a part and the "ethos of the times" of their college years. (4) Although assimilation into the student society is the foremost

concern of most new students, the student body as an entity possesses characteristic qualities of personality, ways of interlacing socially, and types of values and beliefs, which are passed on from one "generation" of students to another and provide a basic context in which individual learning takes place.

While the price of higher education is high and going higher, this cost is far less costly to the American people than settling for the wasteful ineffectiveness of educational mediocrity, declared the Problems and Policies Committee of the American Council on Education last month. Entitled "The Price of Excellence: A Report to Decision-Makers in American Higher Education," the Committee's statement called for a major advance from present levels of financial support for the colleges "to those already evident in such areas as military defense and highway development." The report calls for greater efficiency and economy by the colleges, but says that the central educational purpose is more important: "Although it can be argued that quality in higher education is worth whatever it may cost, colleges and universities are under no less obligation than other forms of enterprise to operate as efficiently as possible. But educational institutions do not produce standardized products, and it is a mistake to impose common denominators of accounting upon them. . . . So important is the end in view, both to the individual and to our free society, that true economy dictates the choice of the most effective rather than the least expensive means."

Record enrollments were reported last month by several Catholic colleges. Among those reporting to us are: St. Peter's, Jersey City, 1,977 students, 517 of these being in the evening division; Manhattan, 3,125 students in its three schools; St. Norbert, West de Pere, Wisconsin, 1,165 students; University of Dayton, 6,829 students, and St. Louis University, 8,048 students.

Foreign students enrolled in Catholic colleges and universities this fall number 5,055, according to a report from the National Catholic Educational Association. The total represents a drop from the 5,224 students reported last year, but last year's total included 238 Hawaiians. The NCEA said that 221 institutions responded to its questionnaire on foreign students, a response of 96 per cent. Only fourteen colleges reported no foreign students.

SECONDARY EDUCATION NOTES

Is a monolithic school system the ideal, as public school educators see it, for American education? This question, among others, is raised by Monsignor John B. McDowell, superintendent of schools, Diocese of Pittsburgh, Pennsylvania, writing in *The Catholic High School Quarterly Bulletin* (Vol. XVIII, No. 2). Commenting on Dr. James B. Conant's report, *The American High School Today,* Msgr. McDowell states that the idea of a monolithic, monopolistic secondary school system is not uncommon in the writings of public school philosophers. In line with this viewpoint, Dr. Conant maintains that the counseling system of the school is not to supplant the parent, but rather it is to supplement parental advice. Aside from this statement, no acknowledgment is given to any other unit, group, organization, or element in society as an educative agent. The total failure to recognize any other agency is an obvious although not startling element of this report. It is not shocking, states Msgr. McDowell, to learn that in such a philosophy, the home, the Church, the private school, and the parochial school are ignored. The public school, rather the comprehensive public school, is destined to educate all the youth of the community if the job is to be done properly. It is also destined to do the entire job. Dr. Conant does not hesitate to suggest that in some areas an overemphasis on pre-college programs is evident because of parental pressure. This suggests that it is the state and the professionals who must make the decisions and who know best what is good for the country. It is also maintained that the vocational programs in most schools which were studied were inadequate because school authorities were not studying with sufficient care the varied needs of the local community. Msgr. McDowell concludes by asserting that the Conant report is an outstanding example of a widely accepted American philosophy of education. The comprehensive high school is a new vehicle to implement this philosophy. It is this aspect of the report which should evoke considerable concern on the part of all who love America and who are concerned about her future as a free nation. Public education needs Catholic and other private education if for no other reason than to preserve a pluralism in education. It is this pluralism in our society which has made America what it is today and which continues to be a source of strength and vitality.

English textbooks used in American high schools are being evaluated by two professors of English at the University of California. The project was prompted by the belief that selection of textbooks is a key to the development of sound, effective programs of literature and composition. Professors James J. Lynch and Bertrand Evans are being supported in their year-long project by a grant from the Old Dominion Foundation. The professors intend to examine widely used textbooks including anthologies of literature, grammar and composition texts, workbooks, and high-school editions of the classics. Several hundred volumes will come under their scrutiny before next June. They will also examine book adoption practices of teachers, administrators, commissions, and other groups charged with the selection of high school textbooks.

Widespread use of standardized admissions tests for college was criticized by a psychologist at the American Psychological Association's annual meeting. As reported in *Overview* (October, 1960), Dr. Joshua Fishman, director of research at the Greenfield Center of Human Relations, University of Pennsylvania, and recently named dean of the Graduate School of Education at Yeshiva University, said that mistaken evaluation of the results and the lack of philosophical goals are carrying these tests far beyond their original concept. Fishman was especially critical of the misapplication of test results and their frequent use for the sake of prestige. Another great problem, Fishman observed, is that results are treated as irrevocable pictures of the individual student, rather than as "momentary and reversible" readings. So, far, he said, psychologists have not been able to disentangle promise from deliverance, potentiality from actuality, aptitude from achievement. Meanwhile the College Entrance Examination Board in New York revealed that an unusually large number of institutions were contemplating using its services. Sixty-two new schools have applied for CEEB membership. If all are accepted it would raise the board's roster to 349 members.

A poll on the popularity of Latin was taken by the superintendent of schools of Uniontown, Pennsylvania. One hundred and thirty-two colleges responded to a questionnaire aimed at determining the importance of Latin in the secondary school curriculum. The schools were a highly representative group of higher institutions including Ivy League colleges, state universities, state teachers colleges, Catho-

lic colleges, and small women's colleges. The results of the poll are these: (1) Of the 132 institutions, only 3 require Latin for admission. (2) One hundred twenty of the schools do not give admission preference to students with Latin on their high-school transcripts over those with a modern language preparation. (3) Eighty-nine schools believe that any need for Latin can be satisfied on the college level. (4) Eighty-six strongly recommended four years of one language rather than the common practice of two years of two languages. (5) By a ratio of 4 to 1, four years of a modern language is preferred over four years of Latin for high-school graduates. (6) Where a school program is limited by enrollment, modern languages are recommended over Latin by a 2 to 1 ratio. (7) Two-thirds of the colleges believe that the related values assessed to Latin, such as classical significance, derivation of word value, mental discipline, language construction, and word recognition, can be satisfied in other areas of instruction without studying Latin. (8) Only twelve of the institutions require their graduates to take Latin for graduation on the baccalaureate level, and five of these are sectarian schools. (9) The majority believe that present world conditions dictate a more compelling reason for studying modern languages than for studying Latin. But they hold that Latin should be reserved for those with a scholarly interest in the subject. (10) Technical and engineering schools, specifically, are almost unanimous in their opinion that students should be prepared in modern languages. Last spring Oxford University abolished Latin along with Greek as an entrance requirement for science students and Cambridge is planning to follow suit.

In a move to improve the quality of teaching, the New York State Board of Regents has adopted higher minimum requirements for new high-school teachers of academic subjects. Course requirements for foreign languages, mathematics, and science teachers have been doubled for beginning certificates to teach in the State's high schools. Requirements for English and social studies teachers were increased 50 per cent. Specifically the new requirements will be: English—36 semester hours, an increase of 12; foreign languages—24 hours, an increase of 12; mathematics—18 hours, an increase of 9; science—42 hours, an increase of 21; and social studies—36 hours, an increase of 12.

ELEMENTARY EDUCATION NOTES

Pupils in urban public elementary schools are promoted generally only if their academic achievement justifies it; only a small minority of them are passed primarily to enable them to progress with their age group. This is one of the conclusions of the first scientifically-planned survey of the status of administration and organization of the public elementary schools just completed by the U. S. Office of Education. Survey results show that nearly three-fifths, or 58.5 per cent, of the urban school districts reporting give first consideration to the academic achievement of the pupil and only secondary consideration to his keeping up with his social peer group. Another 12.5 per cent of the districts promote solely on the basis of academic achievement. An emphasis on keeping the child in his own age group was reported by 10.8 per cent of the districts, but less than one per cent reported promoting solely on the basis of group progress. Schools in most urban places report pupil progress to parents by letter marks rather than by number marks. More than three-fourths of the districts use letter marks alone or in combination with parent conferences.

Two-teacher team teaching in the elementary grades is being experimented with this year in Patchogue, New York. Under the plan, a pair of teachers will handle two grades. One of the pair might teach English and social studies; the other, science, mathematics, and health. The teaching combination may differ with each team. For example, if the two classes affected are the fifth and sixth grades, one teacher may teach her specialties to the fifth grade in the morning, then teach the same subjects at a different level to the sixth grade in the afternoon. The other teacher would reverse the pattern, teaching her specialties to the sixth grade in the morning and the fifth grade in the afternoon. The object of the experiment, as reported in *School Management* (October, 1960), is to appraise the effectiveness of more specialized instruction at the elmentary-school level. The project calls for the same teachers to remain with their two classes for a period of two years in order to provide for greater continuity of experiences.

Progress of all children — slow, average, and superior — has been improved by closely relating the work of all grades, reports the school district of Sonoma Valley, California. The core of the

program is an ungraded primary division. Fourth grade is self-contained. Fifth and sixth grades are semi-departmentalized; seventh and eighth grades are fully departmentalized. The program in the first three grades is organized on the basis of ten reading levels. Children grouped and assigned to rooms according to their reading level stay at each level until they have mastered its requirements. Those who get ahead of their assigned group move up to the next group. Those who fall behind in their assigned group move down to the next lower group. While most children need three years to complete all levels of the primary division, some take four years and others only two.

If educational television is to become a completely satisfactory tool for teaching in the future, program planners must capitalize on its unique contributions, make their presentations more than mere talking textbooks, and involve the learner to the extent that he will be stimulated to continue studying on his own. These are some of the conclusions in a new publication, *Opportunities for Learning: Guidelines for Television,* from the National Education Association's Division of Audio-Visual Instructional Service. The price is $1.50. This report presents the findings of a group of noted educators who met recently in Washington for a seminar on effective program planning for television. The group found that too often educational programs overemphasize direct teaching, there is too much answer-giving and not enough question-asking, and often there is little student involvement. Some of the suggestions offered as guidelines for future TV planning include presenting programs which become "opportunities for learning" rather than complete packaged "lessons" to be transmitted to learners; provide teachers and learners with a battery of opportunities on television from which to select; and, use TV for those things which it can do best, such as bringing creative experience in art, music, social sciences, and literature to the learners.

When parents help with homework in mathematics, the end does not justify the means. That was the lesson learned by a West Virginia PTA, according to *Education Summary* (October 27, 1960), that recently completed a special, self-financed course in how to work arithmetic problems the modern way. The older generation had to be tutored on modern methods of arithmetic at Marshall College, Huntington, West Virginia.

NEWS FROM THE FIELD

In the transitional junior high school years, the kind of educational program provided for adolescent youth in Grades VII, VIII, and IX is far more important than the organizational placement of those grades within a school system, concludes Dr. James B. Conant in a report issued last month, *Recommendations for Education in the Junior High School Years,* published by the Educational Testing Service, Princeton, New Jersey. Citing the widespread diversity in school organization, as well as professional disagreement on where these grades should be placed, Dr. Conant says: "When enrollments are large enough, I am convinced it is possible to provide for pupils in Grades VII, VIII, and IX the kinds of educational experiences they need regardless of the structure of the school system." The fourteen recommendations set forth in the report and Dr. Conant's conclusions about school organization are based on observations he and his staff made in their visits to 237 schools in 90 school systems in 23 States during the last academic year. Dr. Conant's fourteen recommendations range from the subjects that should be required to the number of clerks needed in the principal's office. He states that all students in Grades VII and VIII should be required to take the usual academic subjects—English, social studies, mathematics, and science—with about 60 to 70 per cent of weekly classroom time devoted to them. In addition, he emphasizes, all students in these two grades should be required to take art, music, and physical education; all boys should receive instruction in industrial arts; all girls should take home economics. He urges algebra in Grade VIII and foreign languages on a conversational basis in Grade VII for those who can benefit. He does "not recommend commencing the study of a foreign language prior to Grade VII unless the community demands it, sufficient funds are available, bilingual teachers can be found, and a sequential program can be assured."

Against team teaching and other new plans for organizing instruction is a booklet, *The Self-Contained Classroom,* issued last month by the Association for Supervision and Curriculum Development of the National Education Association, Washington 6, D. C. The booklet describes the self-contained classroom as a "type of curricular organization which allows one group of students and one teacher to be together for a major portion of the school day in the elemen-

tary school and for a large block of time in the junior and senior high school." It values the teacher's psychological and pedagogical knowledge more highly than specialized training in subject matter. It says that "there is real cause for alarm" because "sincere, but often uninformed, pressure groups are springing up throughout the nation" demanding that the self-contained classroom be replaced by departmentalized, subject-conscious schools and that "science and mathematics receive top priority over music, art and physical education." Those who in the recent past advocated reforms this report is against include Dr. James B. Conant, who has urged early departmentalization in the junior high school, and Dr. J. Lloyd Trump, who, in his report *Images of the Future,* relies strongly on subject specialists, team teaching, and other new organizational ideas.

Denominational religious books may be bought for public school libraries in California, the State's attorney general has ruled, reports *Education Summary* (September 27, 1960). Public school authorities may purchase books without regard to whether the books are sectarian, partisan or denominational as long as they deem the books necessary. The question had been raised whether the practice conflicted with statutes forbidding the teaching of sectarian doctrine in the schools. The attorney general said caution should be exercised to make sure the books are for library and not for classroom use.

The place of Latin in secondary schools is discussed by Dr. Brooks Otis, head of the Department of Classics, Stanford University, in the *California Journal of Secondary Education* (October, 1960). He maintains that "Latin should be studied by at least an appreciable minority precisely because it is a 'dead' language, remote from the immediate present. For Latin is really the one subject in the school curriculum where direct contact is made with the classical past from which our Western civilization sprang and without which that civilization cannot be understood. It is the one subject that gives depth and relief to an otherwise flat modernity." To put Latin back in its proper place in the curriculum, he suggests a three-point program, involving (1) a three-year minimum program in Latin between Grades VII and XII, (2) subjecting the Latin curriculum to as rigorous a re-examination as that of the modern foreign languages, and (3) drawing up a clear statement of the goal of Latin teaching as a guide in planning classroom practices.

BOOK REVIEWS

IT'S YOUR PERSONALITY by William J. McMahon and others. New York: Harcourt, Brace and Co., 1960. Pp. xii+356. $2.64.

This is the latest of the Insight Series, an excellent set of texts for use with Catholic high-school students in guidance and homeroom classes. The authors are Rev. William McMahon, guidance director of Cardinal Hayes High School, in New York City; James J. Cribbin, associate professor at New York University; Bro. Philip Harris, director of student personnel at St. Francis College, in Brooklyn: and Sister Barbara, community supervisor of secondary schools, Sisters of Charity, Cincinnati. Their stated purpose is to build for the student "a staircase of self-knowledge."

The book is organized into seven units dealing with, respectively, Understanding and Developing Your Personality, Recognizing Roadblocks to Personality Development, Overcoming Roadblocks to Personality Development, Building a Mature Personality, Living With Young People, Living With Adults, and Living in the Community.

The reviewer liked many things about the volume — such as the definition of adjustment (p. 39), the definition of personality (p. 6), and a thoughtful, balanced treatment of Catholic-non-Catholic relations in a pluralistic society. Like other books in the same series, the book provides supplementary helps such as a Things to Think About section after each chapter. Perhaps there is too much admixture of the psychological and the moral without each being identified for what it is. Adolescents are, as a rule, already too prone to this particular confusion. On the whole, though, this book is a very praiseworthy addition to a very fine series.

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THE SCHOOL BUS LAW by Theodore Powell. Middletown, Conn.: Wesleyan University Press, 1960. Pp. xi + 334. $5.00.

Theodore Powell's book is required reading for those who are interested in the question of transportation of nonpublic school chil-

dren. This issue has been raised most recently in the State of Connecticut. *The School Bus Law* is a detailed case study of the inception of the Connecticut law and its effect upon the community.

The first part of the book discusses the legal question of aid for children who attend religious schools as defined by the U. S. Supreme Court in five momentous decisions. Background material on the *Pierce, Cochran, Everson, McCollum* and *Zorach* cases is supplied as a setting for the legal battle that was to take place in Connecticut. Little mention is made of the other States which have had this issue decided in their courts. Inclusion of these cases might have provided a good comparison with what happened in Connecticut without clouding the main purpose of the book.

The major portion of this study is a presentation of the forces at work in promoting or opposing the bill which provided transportation for parochial school children. This is its most important contribution. Transportation can become an explosive issue especially when the Church-State question is raised. According to Powell this is exactly what happened in Connecticut. He presents, in a rather objective manner, the arguments set forth by the opponents and proponents of the transportation bill. The author shows how organizations such as POAU interest themselves in this question by sending in counsel and finances to oppose transportation for nonpublic school children.

The chapter on "The Legislative Struggle" deals with the practical politics of how the Connecticut bill was passed. It makes for exciting reading since the bill in the Connecticut House passed by only one vote. After the bill was enacted into law it was attacked in the Connecticut courts as unconstitutional. In both the lower and higher courts of the State, its constitutionality was upheld. The case has been appealed to the Supreme Court of the United States. If that court assumes jurisdiction, its decision will have great effects not only for Connecticut but for the rest of the country.

Theodore Powell is public information consultant to the Connecticut State Board of Education. In the preface he states,

> This book attempts to be an objective study of the role of religious groups as a political force. It would be pretentious for an author to claim that he had succeeded in excluding all bias from his work, but a diligent effort has been made to do so here. The reader is asked to approach the follow-

ing pages in the spirit of the study, to set aside bias and view the chronicle without precommitment.

Although one might not agree with the author's objectivity in all parts of the book, nevertheless, the lessons taught by the Connecticut controversy, as set forth in this study, should help in a clearer presentation of the transportation issue in future cases.

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CONTEMPORARY LITERARY SCHOLARSHIP, edited by Lewis Leary. New York: Appleton-Century-Crofts, Inc., 1958. Pp. x + 474. $5.00.

This is a series of essays which had its origin in papers presented under the sponsorship of the Committee on Literary Scholarship and the Teaching of English at meetings of the National Council of Teachers of English in 1955 and 1956 and during the summer session at Columbia University in 1956. Each essay is by an expert in his field and the literary periods and various genres are treated. Jacques Barzun, already familiar to all of us for his illuminating *Teacher in America* (New York: Doubleday, 1944, available in Doubleday Anchor Paperbacks, 1954) opens the series with "The Scholar-Critic." The days of the polymath scholar are over—no man any longer dares teach both higher mathematics and Greek as was often the case a century ago. Now science has its day and humanistic subjects are studied in a formal methodology. Even journalism requires the documentation of footnotes; the impressionistic essay of the undergraduate of a generation ago has been replaced by the term paper and the monograph. But in the meanwhile the university itself has welcomed such creative people as actors, musicians, poets, artists, and critics.

The following essay, "Literary Scholarship and the Teaching of English" by the editor, dovetails into this pattern and shows how the teacher must be at the same time both creative artist and active scholar. A suitable intellectual background and the historical sense are necessary for the teacher whose participation in research only

guarantees that he is abreast of the times for his own and students' sake. Nine essays on the main periods of English literature follow, from Beowulf to contemporary American literature. For the past generation now scholars have been studying literary masterpieces as works of art in their own milieu, instead of treating especially the older works as a *corpus vile* for philological analysis. "The Chaucer Trust" is still strong to judge by the long treatment in this book. A chapter on "Shakespeare and his Times" by G. E. Bentley covers the early Modern English period. The seventeenth and eighteenth centuries each come in for a chapter (Merrit Y. Hughes and James L. Clifford) as do the Romantic Movement (R. H. Fogle) and the Victorian period (L. Stevenson). Contemporary literature in both Britain and America each merits a separate chapter (Fred B. Millett and B. W. B. Lewis).

The genres are treated in the last section of the book. Again the contrast is made with the pre-1930 scholarship, treatment of literary themes and the present. One might well say that Wellek and Warren's *Theory of Literature* (1950) not only marked a milestone in the study of literature as the editors had intended, but it should be required reading for deans of graduate schools (if they can read the book) the country around. Poetry, the novel, and drama are treated in their proper place. Charlton Laird in writing on Comparative Literature comes up with the axiomatic statement that the comparatist must be able to command at least two languages fluently. *Weltliteratur* and the Great Books courses now seem to have replaced the old *littérature comparée* at certain American universities. He says that the *world literature* courses "seemed a pretentious term for a sampling of British and Continental masterpieces, savored with a few snippets out of Asia." Now since the second World War, in the name of *humanitas* or whatever, Great Books courses have swamped all but the most conservative colleges and universities. The last two essays take into account the audience, "The Public Arts and Private Sensibility" by P. D. Hazard and the "Literary Audience" by Lennox Gray. Here questions of mass communication are considered in relation to mass production. Those who decry the ascendancy of technology should remember that the machine age has also made possible research libraries, audio-visual aids, microfilm, scholarly journals, and university presses. It has given more teaching jobs, has made conventions possible *and* several convenient ways to attend them.

Thoreau living on the edge of Walden pond decried the coming of railroad and telegraphy; yet his reading public today is wider than it was a hundred years ago. The book gives the nonspecialist a good view of the over-all developments in scholarship in the past generation, and even the specialist in one of the periods may here see what his colleagues have been doing in the different periods of his general field.

ROBERT T. MEYER

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BOOKS RECEIVED

Educational

Abbott, Rev. James. *Catechism Key.* Dublin, Ireland: M. H. Gill and Son Ltd. Pp. 73.

Adventure Kit of Mathematics. New York: Golden Press Inc. $2.95.

Bunger, Fred Anton. *Cultural Forces and Academic Success in College Freshmen.* Lexington, Ky.: College of Education, University of Kentucky. Pp. 91. $1.00.

Butler, Charles H., and Wren, F. Lynwood. *The Teaching of Secondary Mathematics.* New York: McGraw-Hill Book Co., Inc. Pp. 624. $7.50.

China Today. Classroom Enrichment Material. Maryknoll, N. Y.: Maryknoll Publications. Pp. 64. $1.00.

Didier, Sister Mary Ambrose. *The Vocabulary of General Science at the Eighth-Grade Level.* Washington, D. C.: Catholic University of America Press. Pp. 80. $1.50.

Duncan, Ray O., and Watson, Helen B. *Introduction to Physical Education.* New York: Ronald Press Co. Pp. 204. $4.00.

Kennedy, Arthur G., and Sands, Donald B. *A Concise Bibliography for Students of English.* 4th Edition. Stanford, Calif.: Stanford University Press. Pp. 467. $5.00.

Latin America Today. Classroom Enrichment Material. Maryknoll, N. Y.: Maryknoll Publications. $1.00.

Leslie, Louis A., and others. *Gregg Notehand.* New York: McGraw-Hill Book Co., Inc., Gregg Publishing Division. Pp. 320. $4.48.

Leslie, Louis A., and others. *Teacher's Guide for Gregg Notehand.* New York: McGraw-Hill Book Co., Inc., Gregg Publishing Division. Pp. 40.

Peet, Harriet, E. *The Creative Individual.* A Study of New Perspectives in American Education. New York: Ronald Press Co. Pp. 188. $4.50.

Saterstrom, Mary Horkheimer (ed.), with Renner, John W. *Educators Guide to Free Science Materials.* Randolph, Wis.: Educators Progress Service. Pp. 298. $6.25.

Schneiders, Alexander A. *Personality Development and Adjustment in Adolescence.* Milwaukee: Bruce Publishing Co. Pp. 473. $5.75.

Strom, Ingrid M. *Research in Grammar and Usage and Its Implications for Teaching Writing.* Bloomington: Indiana University Bookstore. Pp. 23. $1.25.

Valois, A. John. *A Study of Operationism and Its Implications for Educational Psychology.* Washington, D. C.: Catholic University of America Press. Pp. 162. $2.75.

Wheelock, Frederic M. *Latin: An Introductory Course Based on Ancient Authors.* 2nd Edition. New York: Barnes and Noble, Inc. Pp. 377. $4.00 cloth; $1.95 paper.

General

Alberghi, Sante. *Metafisica e Spiritualisti Italiani Contemporanei.* Pubblicazioni dell' Istituto di Filosofia dell' Universitá di Genova, Vol. XVI. Milano (Italy): Marzorati-Editore. Pp. 320. L. 2.400.

Bosco, Antoinette. *Charles John Seghers: Pioneer in Alaska.* New York: P. J. Kenedy and Sons. Pp. 190. $2.50.

Crockett, Lucy Herndon. *The Year Something Almost Happened in Pinoso.* New York: Pantheon Books Inc. Pp. 160. $3.00.

Cross, John. *Let's Take the Hard Road!* A Book on Strength for Young Men. Vol. I. Kenosha, Wis.: Cross Publications. Pp. 207. $3.95.

Daley, Arthur. *Knute Rockne: Football Wizard of Notre Dame.* New York: P. J. Kenedy and Sons. Pp. 191. $2.50.

Ellis, Harry B. *Challenge in the Middle East.* Communist Influence and American Policy. New York: Ronald Press Co. Pp. 238. $4.00.

Fages, Raymond. *Examen: The Sacraments in Our Daily Life.* Trans. Kathryn Sullivan, R.S.C.J. Chicago: Henry Regnery Co. Pp. 84. $1.45.

Goldschmidt, Walter (ed.). *Readings in the Ways of Mankind.* Vols. I and II. White Plains, N. Y.: Fund for Adult Education. Pp. 177; 194.

Offen, M.D., J. Allan. *Adventure to Motherhood.* New York: Taplinger Publishing Co., Inc. Pp. 72. $2.95.

Palanque, Jean-Rémy. *The Dawn of the Middle Ages.* Trans. Dom Finbarr Murphy. New York: Hawthorn Books. Pp. 126. $2.95.

Participation in the Mass. Proceedings of the 1959 Liturgical Week, University of Notre Dame, August 23-26, 1959. Washington, D. C.: Liturgical Conference. Pp. 299. $3.00.

Pontifex, O.S.B., Mark. *Freedom and Providence.* New York: Hawthorn Books. Pp. 135. $2.95.

Portalié, S.J., Eugène. *A Guide to the Thought of Saint Augustine.* Trans. Ralph J. Bastian, S.J. Chicago: Henry Regnery Co. Pp. 428. $6.50.

Ross, Eva J. *Sociology and Social Problems.* Milwaukee: Bruce Publishing Co. Pp. 275. $3.96.

Stanford, O.S.A., Edward V. *Foundations of Christian Belief.* An Introductory Course in Apologetics. Westminster, Md.: Newman Press. Pp. 241. $1.95.

Steinberg, S. H. (ed.). *The Statesman's Year-Book, 1960-1961.* New York: St. Martin's Press Inc. Pp. 1677. $9.50.

Stoeberl, O.F.M. Cap., Julian. *God, Government, and the Catholic Church.* St. Louis: Queen's Work. Pp. 24. $0.10.

Welty, O.P., Eberhard. *A Handbook of Christian Social Ethics.* Vol. I. Man in Society. New York: Herder and Herder. Pp. 395. $6.95.

Wood, S.M., Robert. *Vocation to Knighthood Now.* St. Louis: Queen's Work. Pp. 21. $0.10.

NEWS OF PRODUCTS AND SERVICES

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The Holy Bible, adapted and illustrated for young Catholic readers has recently been published by Guild Press. Printed in large and easy-to-read type, this 260-page deluxe volume contains great stories of the Old and New Testaments. There are more than 300 illustrations, most of which are in full color. In addition, *The Holy Bible* contains an 18-page section on the Mass, with color photographs and an explanatory text that together follow the actions of the priest as he offers the Holy Sacrifice. The *Imprimatur* is by Francis Cardinal Spellman. Write to: *Golden Press, Inc., 630 Fifth Ave., New York 20, N. Y.*

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HUMAN EVOLUTION — 1956 (Reprint)

Because of popular demand, the article on *Human Evolution — 1956*, with Appendix, *The Present Catholic Attitude Towards Evolution*, has now been reprinted. This authoritative article, by Rev. J. Franklin Ewing, S.J., Ph.D., Professor of Physical Anthropology at Fordham University, is written in a non-technical style, and should be of particular interest to all Catholic students and educators. The article is now in its fourth reprinting. Order from: *Anthropological Quarterly, The Catholic University of America Press, Washington 17, D. C.*

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